ENGINEERING NEWS-RECORD

ASCE's Holcomb: To attract CEs, money talks p.74

A McGRAW-HILL PUBLICA

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Architect: J. George Stewart, Architect of the Capitol
Associate Architects: Harbeson Hough Livingston & Larson, Philadelphia
General Contractors: McCloskey & Company, Philadelphia

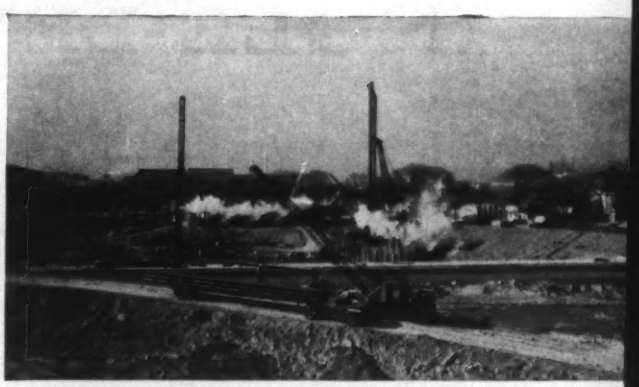
New Capitol Hill Building Rests on Armco Pipe Piles

The new House of Representatives Office Building now under construction in Washington, D.C., costing an estimated $66-million, is supported by almost 86 miles of welded steel Armco Pipe Piles.

These pipe piles have an outside diameter of 10¾ inches and a wall thickness of 0.279-inch. The piles were designed for a 55-ton loading, and various piles were tested to 125 tons with a net settlement of from 0.25- to 0.279 inch. These tests indicated 50- to 60-foot long piles would be required. About 9,000 Armco Pipe Piles were driven for this project with a Vulcan (Model 0) hammer.

This "H"-shaped building, providing 169 three-room suites for members of the House of Representatives as well as numerous other facilities, is scheduled for completion in 1963.

For illustrated factual literature on Armco Pipe Piles, write us. Armco Drainage & Metal Products, Inc., 6510 Curtis Street, Middletown, Ohio.



Sixty-foot lengths of Armco Pipe Piles are delivered at the site of the new House of Representatives building.

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OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

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You shift from any one gear to any other—forward or reverse . . . on-the-go. Allis-Chalmers tractor loaders make fast work far easier for any operator.

It's simple for a tractor loader operator to work faster—get more done. It's just as easy for him to go into a high gear as into a low gear—forward or reverse. ONE LEVER controls both speed and direction. No fumbling around with two or more levers or a combination of levers and foot pedals.

Besides operating simplicity, a tractor loader has *firmly connected axles*—attached to frame with 2-inch diameter steel pins . . . no rolling and shifting under load. *Extra stability* lets operators get and deliver bigger loads with greater comfort. Add *extra reach* for fast, even dumping and you can see why production is higher with an Allis-Chalmers tractor loader. Let your dealer show you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

The "Big Three" tractor loaders range in size from the TL-14 with 5,300-lb carry capacity to the TL-20 (shown) with 9,000-lb carry. Each has a family of buckets—18 bucket loader combinations in all.

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Beams & Piles

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Richmond
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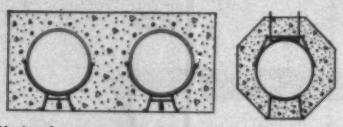
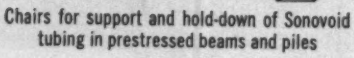


Chairs for support and hold-down of Sonovoid tubing in prestressed beams and piles



Spacers for spirals of prestressed piles

The rapidly increasing use of prestressed concrete has created the need for a variety of products in its preparation and application. Richmond, with the know-how gained through 49 years experience in the concrete construction field, has developed a full line of supports, strand deflectors, spacers, lifting inserts, anchors and fasteners designed for fast, safe and economical use.

For more information, about these and other Richmond products for prestressed concrete, send for our free Bulletin No. 11 *—and, if you have any specific concreting problems, ask us about them. Write to:—*

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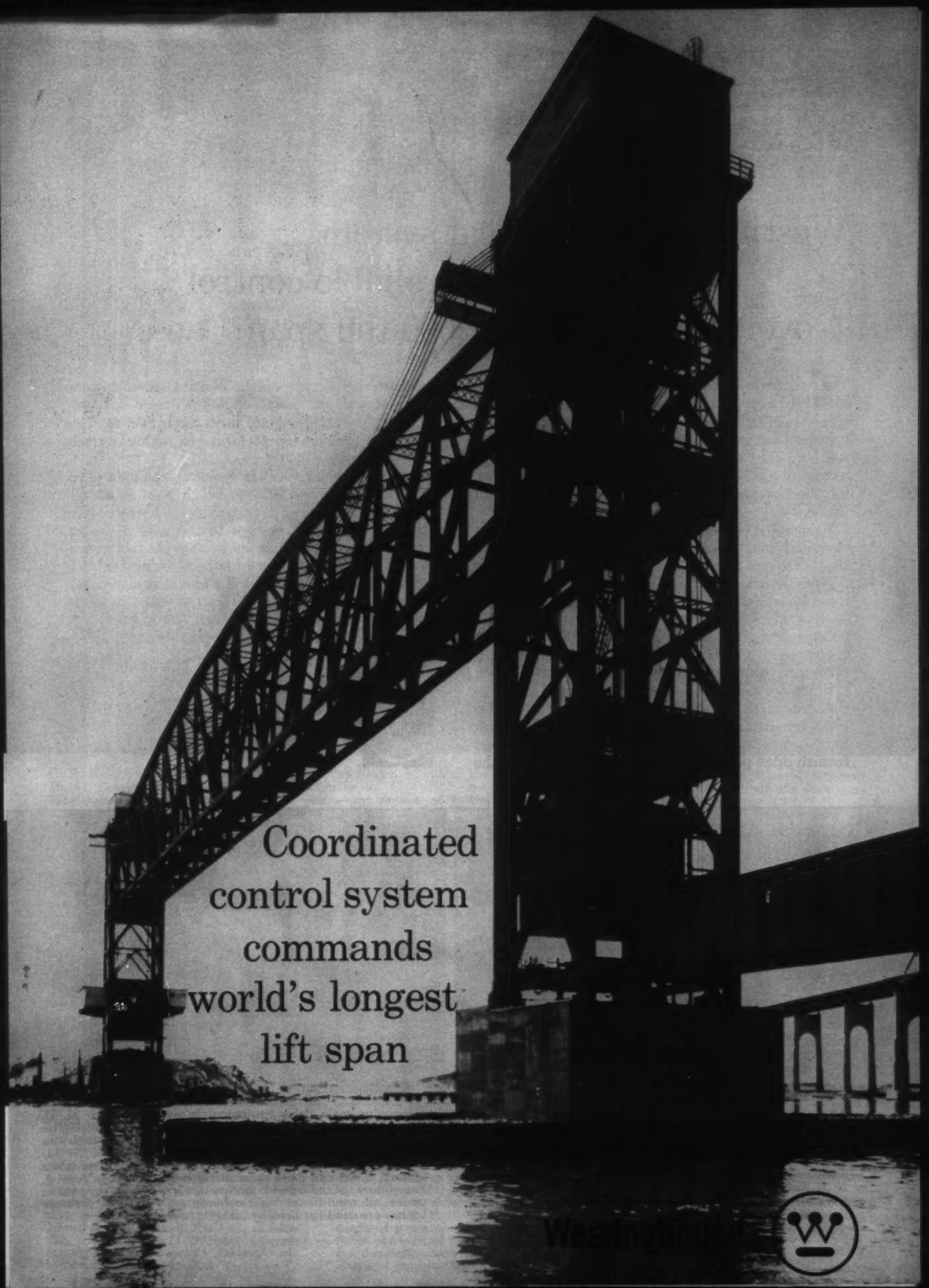

Coordinated
control system
commands
world's longest
lift span

ON COVER: The Arthur Kill Lift Bridge between Staten Island, N. Y., and Elizabeth, N. J., was designed by Parsons, Brinckerhoff, Quade & Douglas for The Staten Island Rapid Transit Railway Company (a wholly owned subsidiary of The Baltimore and Ohio Railroad Company) and built by American Bridge Division of the United States Steel Corporation. 1645 feet long over-all, the bridge is shown with its 558-foot central span in raised position.

Westinghouse electrical system gives precise, reliable control over vertical lift of 2,000-ton span

The new Arthur Kill Bridge boasts the longest vertical lift span ever constructed. The record length span replaces an old swing bridge whose center pier had become a navigational hazard. Westinghouse equipment quickly and smoothly elevates the span 104 feet to leave a 500-foot-wide clear navigation channel for the passage of ships—lowers the span for rail traffic.

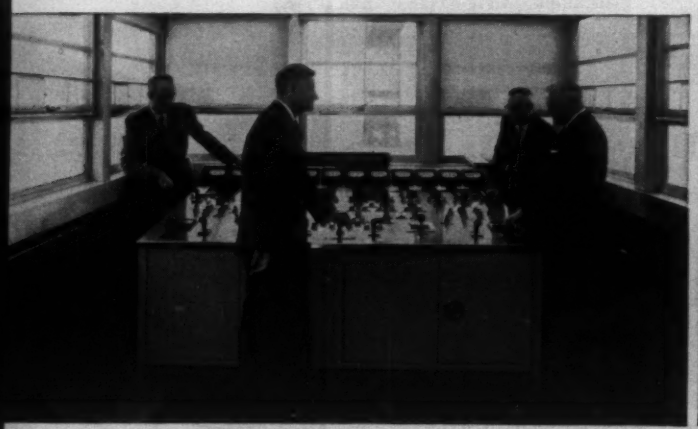
Suspended between two shore towers, the counterweighted main span is operated by giant cable sheaves driven through reduction gearing. Measuring 558 feet in length and weighing four million pounds, it can be raised or lowered through its 104-foot travel in approximately two minutes. The d-c adjustable voltage drive, furnished by Westinghouse, gives precision speed control and holds skew of the span to a minimum throughout the normal operation cycle.

Smooth acceleration to maximum speed and gentle controlled retardation to stop give the bridge every assurance of a long and useful life with a minimum of maintenance. Standardized d-c mill motors furnish drive power for span operation. Heart of the precision speed control is the Westinghouse Magamp exciter regulator. This simplified design uses the completely static Magamp and a single field rotating exciter to provide top performance with extremely low maintenance.

Drives in each tower are synchronized by a sensitive skew detection scheme which uses static elements to automatically reduce voltage to the leading motor and increase voltage to the trailing motor. This system can be expected to keep the two ends of the lift span within close limits of being perfectly level throughout its travel. To assure bridge operation under emergency conditions, a stand-by diesel engine generator set is installed. A duplicate drive system is also provided and is available at the option of the bridge operator at any time. *(cont'd)*

J-94150-2

Westinghouse



View of main control room in east tower, showing desk from which operator controls all main and auxiliary bridge drives. Special instrumentation, including height and skew indicators, keeps bridge tender informed of all operating conditions. Drive system transfer and power source selection is made from this console. W. C. Carl explains conveniently grouped controls to N. L. Ziegler, Division Engineer (left); J. F. Stevens, Superintendent; and P. K. Partee, General Manager.

Discussing main drive equipment in east tower are M. B. Trimble, Westinghouse Construction Engineer; G. R. Keltie and W. C. Carl. Two type MCPA-614, 135-hp Westinghouse mill motors are shown above—one motor for each of the duplicate drive systems. Systems are arranged so that one motor in each tower can drive span at rated speed. These rugged, heavy-duty, standardized motors assure reliable operation under all conditions. Westinghouse type HI-198 thrustor brakes are used for holding bridge at standstill.

G. R. Keltie, Chief Substation Maintainer, The Staten Island Rapid Transit Railway Company, looks on as W. C. Carl, Westinghouse Construction Engineer, points out details of main d-c control panel. This panel contains type M, 800-amp d-c "loop" contactors, span speed, current limit and skew control Magamps with associated auxiliaries.

Incoming 4160-volt power is reduced to 480 volts by this 500-kva Westinghouse power center. Low-voltage switchgear at rear distributes power to main drive system and bridge electrical auxiliaries. Type DB drawout air circuit breakers provide feeder circuit protection. Discussing installation: John Pucillo, Staten Island Rapid Transit Railway Electrician; Max Pilger, Garfunkel Electric Supply Company; and M. Davis, Westinghouse Sales Supervisor.

John Pucillo is seen operating wall mounted AB-I breaker which controls machinery and room heaters. In foreground, main 125-kw type SK d-c adjustable voltage generator driven by 150-hp type CSP* motor. Generator excitation furnished by Magamp exciter regulator determines operating speed of main drive motors. Small unit at near end is a constant potential generator for drive motor fields and control auxiliaries. The d-c supply for duplicate drive system is furnished by identical equipment.

*Trade-Mark

A Westinghouse control center in the east tower switchboard room is examined by Messrs. Partee, Carl and Ziegler. It contains combination starters for 440-volt auxiliary drives and includes a-c relay panels at each end. Compact control centers are composed of interchangeable, space-saving, easily installed modular units.

J-94150-3

Coordinated control system commands world's longest lift span *(cont'd)*

As supplier of the coordinated electrical systems, Westinghouse assumed complete responsibility for their performance. For more information about how this single-source supply can benefit you, contact your nearby Westinghouse construction sales engineer. Or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

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GENERAL CONTRACTOR: American Bridge Division, United States Steel Corp., Pittsburgh, Pa.
ELECTRICAL CONTRACTORS: Fischbach and Moore, New York, N. Y.
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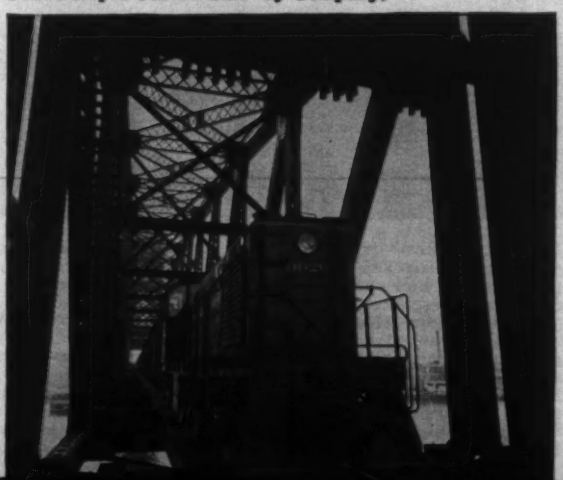
WESTINGHOUSE DISTRIBUTOR: Garfunkel Electrical Supply Co., Jersey City, N. J.

J-94150-4

Westinghouse

Interesting view from mezzanine floor, showing one of four span control auxiliary assemblies. A single machinery take-off to the multiple speed gearbox provides correct ratios to operate type A cam limit switches, height, skew and control transmitters. This construction permitted unit preassembly at machinery builder's plant—assuring fast, easy installation. Seen above: W. C. Carl and G. R. Keltie.

Freight train moving over the recently completed Arthur Kill Lift Bridge is drawn by a diesel engine of The Staten Island Rapid Transit Railway Company.



Reader Comment

Upgrading Degrading?

SIR—I note with much interest but with utter disgust that "the Massachusetts Division of Personnel will send between 700 and 1,000 employees of the Department of Public Works to night school to qualify for associate B. S. degrees in engineering . . . to enable civil service personnel who have been doing various engineering jobs without degrees to move into positions as 'senior' and 'principal' engineers as they open up" (ENR Sept. 8, p. 25).

From the remainder of the item it seems that the intended educational program is a two-year, associate degree program in engineering technology and should not be confused with a B. S. program.

Furthermore, the purpose of such technical institute programs is to provide engineering aides and technicians so that engineers may be freed for truly professional creative work. The proper employment of such technicians tends to improve the professional status of engineers, but to call a technician a senior or principal engineer is extremely degrading to the profession.

RAYMOND J. STITH
Assistant Dean
University of Dayton
Dayton, Ohio

Editor's Note: Dean Stith is right on the nomenclature. An associate degree is not a B. S. Neither is a technician an engineer.

Utility Tunnels

SIR—In your "tongue in cheek" editorial (ENR Sept. 15, p. 116) you asked why someone doesn't invent something "for getting to an object buried under the street without tearing up the pavement", such an invention has been in use for some time—it is called a tunnel.

W. EARLE KOLBE
Harrison Construction Co., Inc.
Alcoa, Tenn.

Editor's Note: Utility tunnels are indeed desirable for making utility lines under streets accessible. ENR has plugged for them before editorially (ENR Aug. 20, 1959, p. 132). It is those utilities already buried—not in tunnels—for which the suggested invention is so badly needed.

(*Reader Comment continued p. 12*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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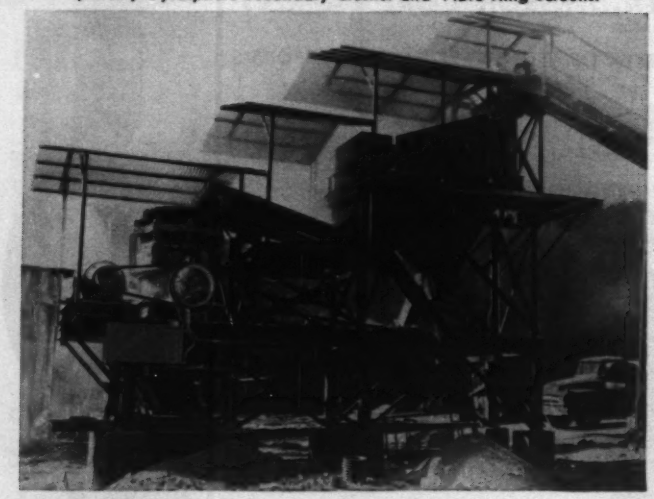
Q-46,560

Georgia Marble Co. crushing plant

(Above) Telsmith Jaw Crusher and Apron Feeder.

(Below) Gyrasphere Secondary Crusher and Vibro-King Screens.



TELSMITH *designed*

to produce road rock and roofing chips

Making 125 tons per hour of 1½" plus ¼", and minus ¼" aggregate for road rock... or crushing everything down to minus ⅜" plus ¼", minus ¼" plus ⅛", and minus ⅛" when producing roofing chips, at 75 tons per hour. That's what Georgia Marble Company's Whiteside, Ga. crushing-screening plant was Telsmith-designed to do. Does it smoothly and steadily day-in-day-out. Tailor-made for today's conditions and competition, Telsmith plants pay off in capacity, product flexibility and operating economy. Send for descriptive bulletins.

TELSMITH Equipment in this plant—

36" x 8' Heavy Duty Apron Feeder • 25 x 36 Roller Bearing Jaw Crusher • 4' x 10' double deck Vibro-King Screen • 36-S Gyrasphere Secondary Crusher • 5' x 16' triple deck Vibro-King Screen • Three 15" x 15" Duplex Bin Gates • Five Telsmith-Barber-Greene Conveyors: 18", 24", 36", total length, 312'.

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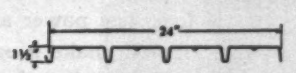
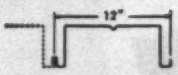
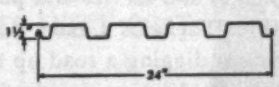


A-DECK — For purlin spacings not exceeding 8'4". Narrow ribs provide deck surface that supports the thinnest or softest type of insulation.

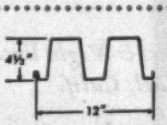


H-DECK — New! For simple spans from 10'0" to 20'0" — 3 and 4½" depths. Especially practical to cover walkways in shopping centers, schools, other installations.

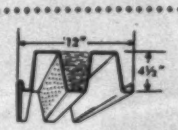


B-DECK — For spans to 10'0". Wide rib distributes metal for greater structural efficiency — gives higher section properties per pound of steel — well suited for use as side wall panels.

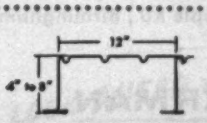
B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70 — used for spans to 10'0".



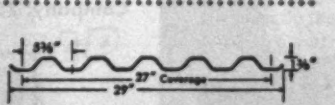
C-DECK—Carries normal roof loads over spans up to 24'0". Used extensively in canopies.



C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24'0".



T-STEEL — New! Galvanized only — for clear spans to 32'0". Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to transmit seismic and wind loads.



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Inland steel deck weighs less than half as much as poured-in-place or pre-cast construction. You can space joists wider and use lighter framework, to save both time and money. Panels are easy to handle and weld in place — in any weather that a man can work.

Types A, B, C, and H decks have the additional advantage of a Bonderized, baked-enamel prime finish that resists on-the-job damage. One field coat of paint on these Inland decks usually covers.

Write for catalogs 240, 241, and 245 — or see Sweet's sections 2c/Inl, 11a/In, and 2a/In.

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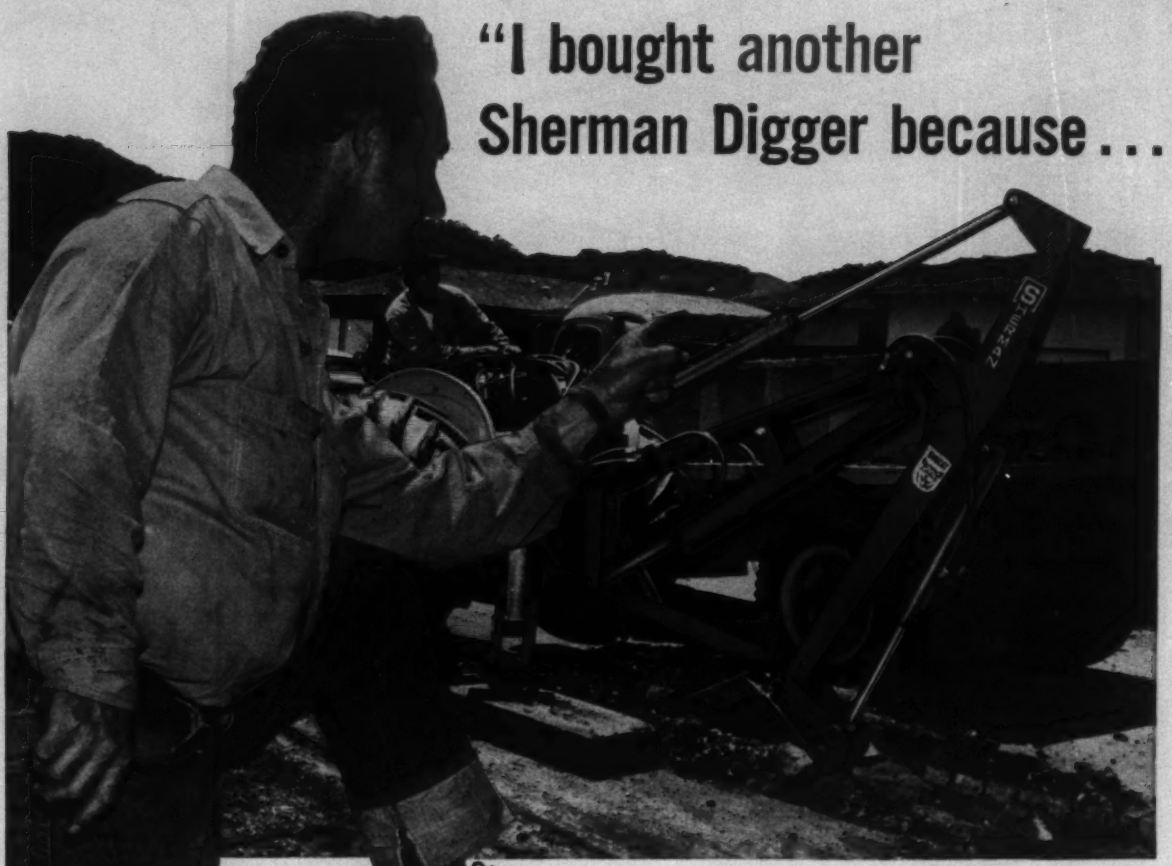
"I bought another Sherman Digger because...



...since 1953, when I got my first Sherman, I have owned a total of five. The power and maneuverability of the Sherman make it easy to adjust to extreme variances in soil and terrain. The self-equalizer stabilizers also help in this respect. Then, too, the Sherman is faster than competitive makes and service and parts are always available. The jobs I have done range all the way from digging a road up the side of a mountain to digging inside San Quentin prison for an electrical contractor. We like the Sherman because we know what we are getting!"

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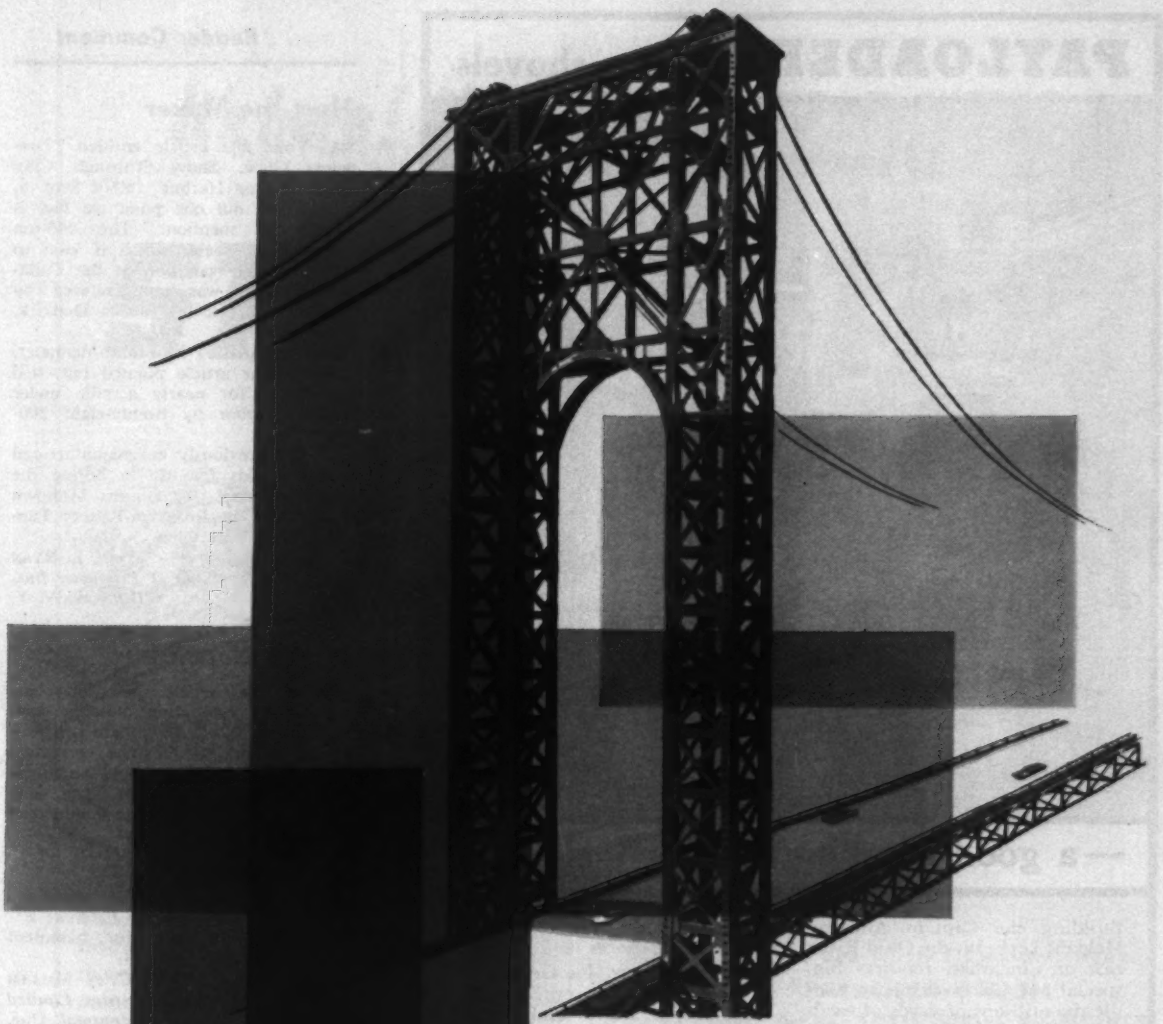

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. . . *Reader Comment*

Meet the Maker

SIR—Your fine article entitled "Tunnelers Claw, Shove Through Clay Under Boston Harbor" (ENR Sept. 8, p. 32) left out one point we feel is worthy of mention: The 240-ton steel tunnel shield, which is vital to the tunneling operation at the Callahan Tunnel, was manufactured by ALCO Products, Inc. at its Dunkirk, N. Y., plant.

The shield is 31 ft, 4 in. in diameter, and as your article pointed out, will be pushed for nearly a mile under Boston Harbor by twenty-eight 200-ton jacks.

ALCO previously has manufactured tunnel shields for use in boring the Lincoln Tunnel, the Queens Midtown Tunnel and the Brooklyn-Battery Tunnel in New York City.

PAUL L. RYAN
ALCO Products, Inc.,
Dunkirk, N. Y.

It's 0.1, Not 0.01

SIR—In the article describing my method for estimating building costs (ENR Sept. 22, p. 88), there is a misplaced decimal point. The correction for suspended floors should be minus 0.1 instead of minus 0.01. The table listing for suspended floors should read

A—no suspended floor, use	(Single story Factor —0.1)

Also, on p. 89, Sample Estimate E1, the correction factor for basement should be minus (—0.07).

C. A. MILLER
Canadian Industries Limited
Montreal, Que.

For your calendar . . .

Industrial Hygiene Foundation of America, annual meeting, Mellon Institute, Pittsburgh, Pa., Oct. 26-27. Write: Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh 13, Pa.

American Concrete Institute, regional meeting, Pioneer Hotel, Tucson, Ariz., Oct. 31-Nov. 2. Write: American Concrete Institute, Box 4754, Redford Station, Detroit 19, Mich.

National Retail Lumber Dealers Association, building materials exposition, Brooks Exhibit Hall, San Francisco, Calif., Nov. 13-17. Write: Robert E. Paine, 302 Ring Building, Washington 6, D. C.

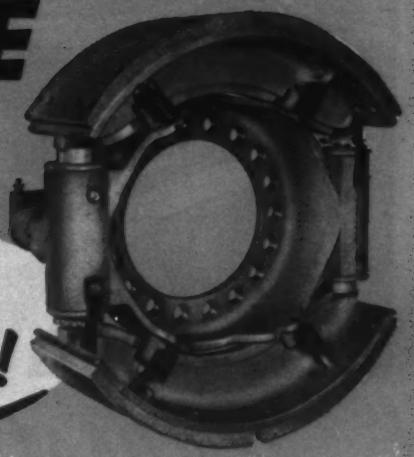
Building Research Institute, fall conference, Shoreham Hotel, Washington, D.C., Nov. 15-17. Write: Harold Horowitz, 2101 Constitution Ave., Washington 25, D.C.

Industrial Building Exposition & Congress, New York Coliseum, Dec. 12-15. Write: Clapp & Poliak, 341 Madison Ave., New York, N. Y.

American Society of Civil Engineers, regional convention, Houston, Tex., Feb. 19-23. Write: E. P. Segner, Jr., Texas A&M College, Civil Engineering Building, College Station, Texas.

American Road Builders Association, annual convention, Haddon Hall, Atlantic City, N. J., March 5-8. Write: Norman T. Almquist, World Center Building, Washington 6, D. C. (Note that the convention is not in Cincinnati as previously reported in ENR.)

It's here! New HEAVY-DUTY STOPMASTER BRAKE



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This new brake is specifically engineered for use on scrapers, prime movers, earth and rock wagons, dump trucks and similar construction vehicles. Available in 17, 20¼, 22 and 26-inch diameters and in 4 to 10-inch widths.

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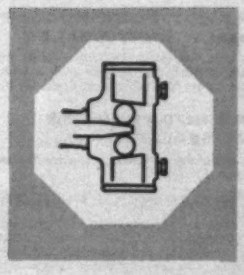

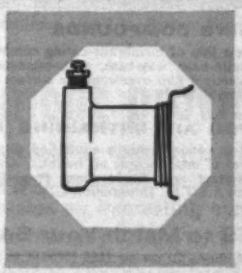

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Results in improved braking performance and lower operating temperatures. In Dual-Actuation design, both shoes do an equal amount of work. Balanced shoe-action assures more dependable service; faster, surer stops.

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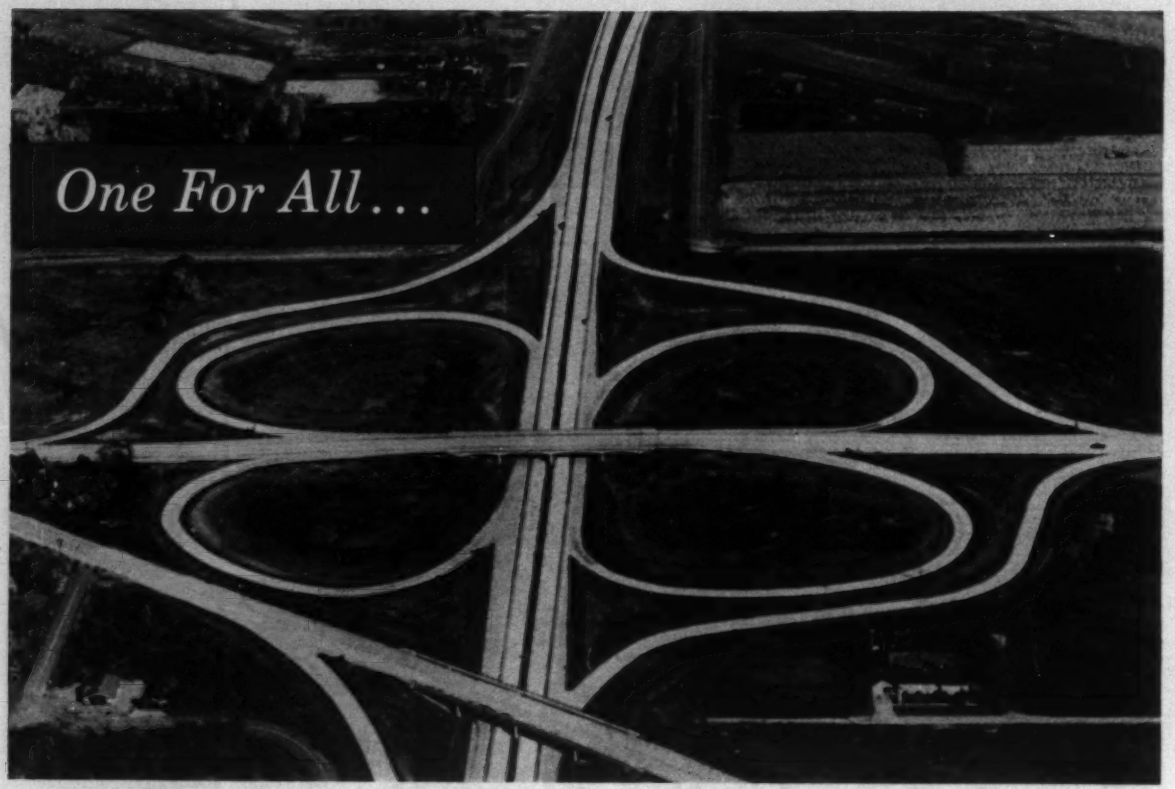
Brake Division, Ashtabula, Ohio



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Cold applied, fast curing polysulfide polymer compound for sealing joints in PCC exposed to jet aircraft operations. Resists jet blast, heat, fuel and oil.

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Modified #55 MIL for sealing joints in PCC highways, non-critical areas of airfields, bridge decks, parking lots, etc.

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Single component, no heating or mixing. Rubber-based for high flexibility, superior weather resistance.

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Two-component, jet-blast resistant, cold-applied for sealing sawed and formed joints. Meets Federal Spec. SS-S-170.

#357.1 HOT-POUR RUBBER-ASPHALT JOINT SEALER

Hot-pour type for concrete joints. Seals out water, foreign matter. Remains flexible over a wide field of service exposures. Meets Federal Spec. SS-S-164.

#357.9 HOT-POUR JFR JOINT SEALER

Specially designed to resist jet aircraft fuel. Meets Federal Spec. SS-S-167.

CD579.1 JOINT CURING TAPE

Concrete joint curing tape. Retains moisture in the concrete essential for curing joints. Protects freshly sawed or formed concrete joints against infiltration of foreign matter, cuts joint cleaning costs to a minimum.

CURING COMPOUNDS

A complete line of membrane-curing compounds including resin-base, wax-base, white-pigmented types. Form watertight film over concrete surface to assure strength and durability.

KAPCO AIR ENTRAINING AGENT

Produces in concrete mix a controlled dispersion of air in form of miscroscopic air bubbles. Also has excellent wetting and dispersement properties. Conforms with A.S.T.M. Designation C260-54.

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Preformed mastic keyed joint. Economical, rigid, waterproof, non-rusting. For highways, streets, airport runways, industrial floors.

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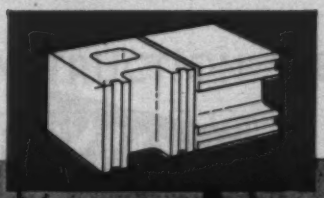
Great new things are shaping up in concrete block



Wall designed by Architect Alfred B. Parker, Miami. Photo courtesy of National Concrete Masonry Association.

Atlas Masonry Cement provides the right mortar

A notable thing about the new look in concrete masonry is what is being done with standard block. Here, for instance, a closed-lattice effect is achieved by laying up "stretcher" type concrete block, so that the ends are exposed. This basket-weave pattern creates an interesting exposed masonry wall resembling hand-hewn stone. For laying up this block, or any concrete masonry unit, ATLAS MASONRY CEMENT continues to be the preferred cementing material in mortar. It produces a smooth, workable mix, provides a strong bond, gives weathertight joints that are uniform in color. And ATLAS MASONRY CEMENT complies fully with ASTM and Federal Specifications. For information on masonry cement write: Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

Universal Atlas Cement Division of United States Steel

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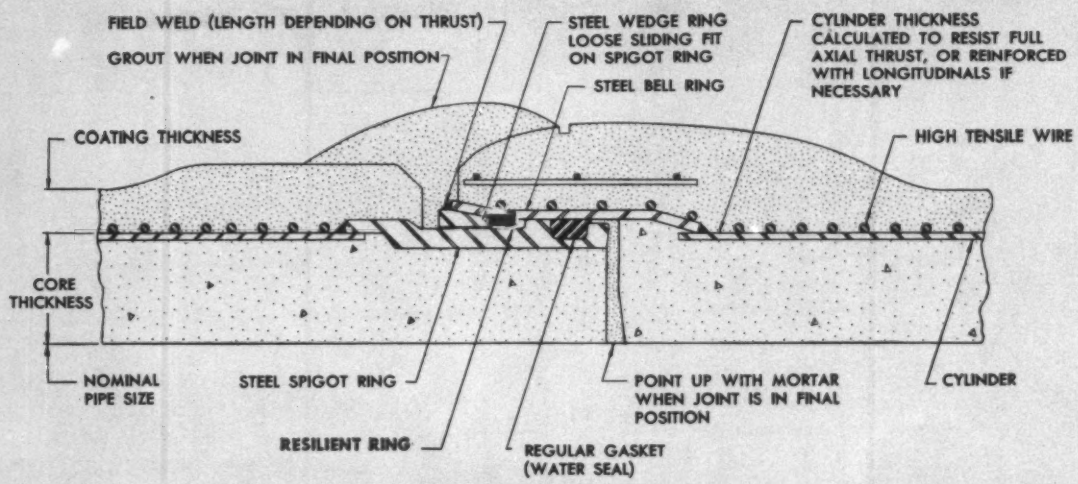
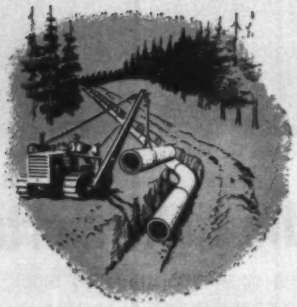
LOCK JOINT'S FLEXIBLE TIED JOINT *


FIELD WELD (LENGTH DEPENDING ON THRUST)
GROUT WHEN JOINT IN FINAL POSITION
STEEL WEDGE RING LOOSE SLIDING FIT ON SPIGOT RING
STEEL BELL RING
CYLINDER THICKNESS CALCULATED TO RESIST FULL AXIAL THRUST, OR REINFORCED WITH LONGITUDINALS IF NECESSARY
COATING THICKNESS
HIGH TENSILE WIRE
CORE THICKNESS
NOMINAL PIPE SIZE
STEEL SPIGOT RING
POINT UP WITH MORTAR WHEN JOINT IS IN FINAL POSITION
CYLINDER
RESILIENT RING
REGULAR GASKET (WATER SEAL)

RUBBER & STEEL FLEXIBLE TIED JOINT

SECURE...FLEXIBLE...WATERTIGHT



Lock Joint Pipe Company, pioneer in the development of efficient, flexible, watertight joints for concrete pressure pipe, once again is first with the most practical solution for restraining thrust at joints where conventional blocking is impossible or impractical.

A greater measure of flexibility is imparted to this field-welded joint by the resilient ring, located between the weld and the watertight rubber gasket seal. This ring also improves the tensile characteristics of the joint by distributing the load more evenly around the periphery of the joint ring.

Detailed description of this joint may be obtained from Lock Joint Pipe Company on request.

**Patent applied for.*

LOCK JOINT PIPE CO.

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Sales Offices: Chicago, Ill. • Columbia, S.C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Kan. • Perryman, Md. • St. Paul, Minn. • Winter Park, Fla.

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ENGINEERING NEWS-RECORD

Vol. 165, No. 16 October 20, 1960

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THE CONSTRUCTION WEEK

SHORT-CHANGED?—Mississippi's Legislative Investigating Committee charges that the contractor for the Biloxi Bay Bridge short-changed the state by about $100,000. In clinching a deal for Japanese Steel strands instead of U. S.-made steel, J. B. Michael & Co., Memphis, cut the price to the state by $15,000. But the contractor actually saved between $108,000 and $126,000, the committee asserts. The committee recommends that the state sue for the difference.

POST FACTO PROTEST—A new $3-million high school in a Detroit suburb stands idle for lack of operating funds because voters have refused to approve a slight tax increase. Many of them are protesting the inclusion of "too many costly frills."

WRONG COURT—Charges against a partner in the roadbuilding firm implicated in the Skelly Bypass scandal have been dismissed on a technicality. Andrew H. Layman, Jr., of Layman and Sons, was charged with receiving payments on roadbuilding materials never used in the section of Interstate in Oklahoma. A Tulsa judge dismissed the case because it was filed in the wrong court—it should have been filed in Oklahoma City.

NEW A-POWER PLANT RISING—Four Carolina-Virginia utilities have started work on a 17,000-kw nuclear power plant at Parr, S. C. It will be the first in the Southeast. The project will cost the utilities group about $28 million and the Atomic Energy Commission $15 million. The reactor will be the pressurized water type. Completion is set for 1962.

TRAFFIC PROGRESS?—The final gap in Chicago's 16-mile Congress Expressway opened to traffic last week, nearly 15 years after construction began. Immediate result: A monumental traffic jam—motorists came out en masse to try the new road.

BIG FREEZE—The Worthington Corp. has received contracts totaling $1.5 million for air conditioning two monumental buildings. The biggest contract, for midtown Manhattan's Pan American Building—the world's largest office building—will supply 10,000 tons of air conditioning. The other contract calls for 4,200 tons of air conditioning for the Humble Oil and Refining Co. Building in Houston.

BETTER LEARN JUDO—To the other hazards of an engineer's profession add unreimbursed assault and battery. A New Jersey court has dismissed a $100,000 damage suit brought by an engineer against a contractor after two laborers, incensed by criticism of their work, beat the engineer up. The court said the beating was prompted by personal motives and had nothing to do with his employment.

"FOSTER Lightweight Piling is stronger, costs less, handles easier . . . PLUS"

When you use Foster Lightweight Piling you get really lower costs—*plus* the safety and versatility of high-strength steel sheeting.

For shoring trenches, protecting shorelines, or for any light-load protection, Foster Lightweight Piling is easy to use. It's designed for manual handling, requires no special crane or rig, and can be driven by a small air or steam hammer. An exclusive "non-jam" interlock permits simple folding together of two sections, yet Foster Lightweight Piling comes apart easily. Unlike wood sheeting, can be used over and over.

For temporary use, or to supplement current piling stocks, you can rent through Foster's Piling Rental Plan and get big savings by eliminating capital tie-up in big piling inventories.

For all types of piling, for highway and construction products, call the Foster Specialist nearest you. Write or call **L. B. FOSTER CO.** for Lightweight Piling Catalog EP-10A, Pittsburgh 30, New York 7, Chicago 4, Houston 2, Los Angeles 5, Atlanta 8, Cleveland 35.

Faster From Foster

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WASHINGTON OBSERVER

- **Probe of materials pricing coming**
- **Dems offer revolutionary financing idea**
- **New rules for shopping center developers**

● **An investigation into steel and cement prices seems certain early next year** regardless of who wins the White House. Senator Estes Kefauver's anti-monopoly committee is working up a report on identical bidding on government contracts. It will deal mainly with identical bids by supposedly competing firms for TVA and Defense Department business.

Senator Kefauver's staff is keeping a sharp eye on news accounts that predict a steel price increase after the first of the year. Such a development would touch off a hard-hitting inquiry for sure. The committee takes credit for inspiring a grand jury in Philadelphia to indict most of the major electrical equipment manufacturing firms for price fixing on TVA contracts and other business.

—

● **A Democratic proposal for financing resource development would revolutionize present government procedures.** The Kennedy-approved plan would set up:

• **A national investment fund that would be tapped by federal, state and local agencies—and by private enterprises,** "when such funds are not available privately on reasonable terms."

• **A capital budget that would keep public investment in dams and other such projects separate from current costs of government.** The Democrats say this proposal would remove the "spending" label from investment in resource projects, making it easier for public agencies to move ahead.

The proposals were drawn up by the Democratic Advisory Council, which includes some of the top party officials in the resource-conscious West and Northwest. Senator Kennedy and his aides apparently believe they have a vote-getting issue in urging increased resource development.

Obviously, it would take a bit of doing to get such measures adopted even if Senator Kennedy should win the White House. Congress would have to pass legislation, and many Democrats as well as most Republicans would be opposed to any such drastic shakeup.

—

● **The Small Business Administration is circulating new regulations for establishment of local development companies.** The rules cover creation of companies aimed primarily at building shopping centers. The companies to get SBA aid will have to be formed solely for local construction, controlled by local persons and will have to put up at least 20% of the financing.

ENGINEERS—A New Installation Concept in Floor Grating!

Simplifies Maintenance, Lowers Total Costs

Now a new installation technique completely eliminates the need to anchor floor grating in place. This allows erection as fast as the structural steel support members are placed and bolted. The technique is only possible with a special reversible Borden Type K panel which will lie perfectly flat on supporting steel with no tendency to rock.

Furthermore, floor grating can now be installed and used for working and walking as quickly as the main structural members are erected. Two men can lift any panel in a matter of seconds for easy accessibility and maintenance.

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Engineers Challenged on Research

- **MIT's Killian says engineers are losing stature because of research lag.**
- **Civils charged with "apathy and indifference."**
- **ASCE convention told that research funds must be increased between 50 and 100%—and now.**

James R. Killian, Jr.—back at MIT from his stint as science advisor to President Eisenhower—sounded the keynote at last week's convention of the American Society of Civil Engineers in Boston.

He challenged the civils to get up and go on research:

In recent years the engineering profession, and particularly the civil engineering profession, has not been realizing its full creative potential," he said. "Despite his distinguished and invaluable service, the engineer has lost stature relative to other professional men, and I suspect one of the principal reasons is that temporarily he has not been keeping pace in the discovery and mastery of new knowledge.

"The strategic role of the civil engineer in the control of our physical environment puts him in the front line in the fight to combat urban decay and to reduce and eliminate the growing pollution of our streams and our air," he continued. "Unless our engineers have (this) sensitivity and responsibility for maintaining and enhancing the quality of our environment as well as its material advantages, the great public works they build today will yield far less benefit to our people."

A key matter, said Mr. Killian, is "the transcendent importance today of revitalizing and upgrading the education of engineers and of weeding obsolescence out of the engineering curriculum."

Glenn W. Holcomb, newly inaugurated president of the 46,000-member society (see p. 74) urged those in attendance "not to be satisfied with our profession as it is today, either technically or professionally.

"The engineering profession cannot be static and unchanging in the world about us," he declared.

Research discussions dominated technical meetings scheduled by 11 of ASCE's 14 technical divisions. In addition to many individual technical papers discussing results of both basic and applied research, three of the divisions—Structures, Soil Mechanics and Foundations, and Highway—held symposiums on research needs and accomplishments.

One general session was called a 1960 Research Conference.

Arthur T. Ippen, MIT professor and chairman of ASCE's Research Committee, listed these recent steps taken by the 108-year-old society to expand its research activities:

- Formation of a research committee within each of the technical divisions.
- Staging of annual research conferences.
- Establishment of five annual research prizes for "notable achievements in research related to civil engineering."
- Creation of a $5,000-scholarship for basic research.
- Holding of an annual research luncheon at the mid-winter meeting.
- Formation of research councils with society backing. The first such group formed under ASCE sponsorship was the Research Council on Pipeline Crossings of Railroads and Highways, established a year ago. Last week, the Board of Direction approved creation of a new Research Council on Air Resources Engineering (air pollution, its concern).
- Creation of the staff position of Director of Research at society headquarters in New York to work with division research committees and with the research councils to pursue the society's research aims. (Formal board action last week established the new position and accepted a grant of $10,000 from the Engineering Foundation for initial financing; society funds will supplement this sum.)

Said Professor Ippen: "A climate of apathy and indifference to research among us exists. Civil engineering does not share in the rapid scientific and technical progress in the world to the extent commensurate with its inherent task in society."

Prof. Nathan M. Newmark, head of the University of Illinois Department of Civil Engineering, estimated that a 50 to 100% increase in research support is needed right now to support instructional programs adequately in civil engineering departments of U. S. universities. And a further doubling will be required in 10 years.

"This means," he said, "that approximately $3.5 million to $7 million of additional research funds are needed annually in civil engineering without curtailing any of the present support, and a total of $10 million to $14 million may be required in 10 years. . . . Without these additional funds, our graduate students will not have the kind of educational experience that they require."

Professor Newmark urged that additional support for research be kept free of controls or restrictions; also, that the results of the research be available for publication by the research worker, whether or not the profession agrees with the results. And he finds that industries in the civil engineering field have not contributed as much to research as industries in other fields and expressed the hope that they would recognize their responsibility by furnishing additional support.

Gen. Arthur G. Trudeau, chief of the U. S. Army's research and development program, also said that private industry was not doing enough basic research. He noted that the federal government now pays for more than 50% of all basic research in this country. The Army's contribution alone amounts to about $50 million a year, expended through 550 laboratories, universities and industries, and 80 Army and other government installations.

"Product development," he said, "important as it is, will not put us out in front, where we belong, or keep us there."

Engineering education came in for its share of attention in one of three "conditions of practice" sessions held during the convention. Dean W. P. Kimball of the Thayer School of Engineering at Dartmouth and Cornelius Wandmacher, Associate Dean of Engineering at the University of Cincin-

nati, reported on the Conference on Civil Engineering Education organized by Cooper Union and held at Ann Arbor, Mich., last July (ENR July 18, p. 21).

Limited discussion time allowed no real reaction to their report.

One view of changing civil engineering education came in a luncheon speech by G. Brooks Earnest, president of Fenn College, Cleveland:

"One easy way is to add another year to the engineer's undergraduate curriculum. Another is to leave the special engineering fields almost entirely to the graduate schools. The undergraduate schools could give a very firm foundation in the basic sciences and a better one in the social sciences and the humanities, if they left advanced work in the special fields of engineering to the graduate level. This may, indeed, be what we are coming to.

"As a solution, however, it has some shortcomings. The graduate schools are not presently equipped to turn out the number of engineers we need. They are quite properly not interested in turning out numbers.

"Something tells me all proposals to make the student go to school longer are fundamentally too easy to be right."

Three ASCE members were made honorary members: Guy F. Atkinson (ENR Oct. 6, p. 65); Solomon C. Hollister, Ithaca, N. Y.; Frank Kerekes, Houghton, Mich. A fourth honorary membership was granted to Fred C. Scobey, Berkeley, Calif., in absentia.

A convention highlight was the presentation of the John Fritz Medal to Stephen D. Bechtel of San Francisco. Five major engineering societies, including ASCE, sponsor the award, presented annually for notable scientific or industrial achievement in the engineering profession.

Karl Terzaghi, the "father of soil mechanics" was twice honored during the meeting. The Harvard professor was the recipient of Great Britain's Ewing Medal, presented on behalf of the Institution of Civil Engineers. Already an honorary member of ASCE, he was presented a certificate by the Soil Mechanics and Foundations Division expressing the sentiments of "countless friends and admirers" and recording their "deep respect and pride of association."

ASCE's board of directors referred the controversial matter of rezoning and redistricting to a committee for further study. Similar treatment was given to the group's continuing study on ethical standards of the society.

Two newly elected directors—Donald H. Mattern, chief of TVA's project planning branch, and William J. Hedley, chief engineer of the Wabash Railroad—and six new directors took office during the convention.

ASCE Told of Improved

Advances in design of shelters for protection from nuclear blasts were revealed at the ASCE convention (see p. 21).

Brig. Gen. Clarence Renshaw, Deputy Chief of Army Engineers for Military Construction, stressed need for balancing protective-construction costs against costs required for other essential construction. To provide "hardening" for all facilities would result in prohibitive total costs, he said.

Therefore, hardening must generally be restricted only to selected facilities of vital importance that must remain in place to serve their mission or that are not suitable for duplication or dispersal.

The Corps of Engineers has made numerous studies to determine the feasibility and cost of protecting various types of Army facilities and operations. One type could provide several million sq ft of depot-type storage in existing mines. Cost for space in limestone formations would be about $20 per sq ft, General Renshaw estimates.

Another type is multiple-arch reinforced concrete construction, with columns spaced 20 ft c-c, protected on top and sides with earth. General Renshaw figures its cost, exclusive of utilities and interior features, at $25 per sq ft. A modification of this design, known as the Stradley Magazine, has flat arches and vertical side walls, inside a clear span of 25 ft and standard lengths of 40, 60 and 80 ft. Cost is estimated to range from $26 to $32 per sq ft.

Rear Admiral E. J. Peltier, chief of the Bureau of Yards and Docks and the Navy Civil Engineer Corps, announced that standard designs are being prepared for a group of personnel shelters. These include fallout shelters at one extreme and blast shelters at the other.

One version, a corrugated steel arch with stiffened ribs, will be designed to protect 100 persons for two weeks against a 75-psi overpressure and related effects. It will have the main entrance at one end of the barrel arch and an emergency exit at the other. A dormitory section will provide bunks for half the occupants. A prototype will be constructed at the Bethesda, Md., Naval Hospital.

The Bureau of Yards and Docks also has developed a standard design for overpressures of 100 to 150 psi. Corrugated steel "cattle pass" sections, circular culverts or concrete pipe can be used. In addition, the Naval Civil Engineering Laboratory has devised a mass-production technique for reinforced concrete arch shelters. It calls for spraying concrete on reusable barrel-arch forms.

Maj. Gen. A. M. Minton, Director of Civil Engineering, U. S. Air Force, pointed out that construction is to start in the near future on a command headquarters near Colorado Springs, Colo., with about 200,000 sq ft of space. It will be located under a mountain with about 1,100 ft of solid cover.

The possibility of providing protection for large aircraft, such as the B 52 and the B 70, is being studied, General Minton said. The most efficient use of contained space for a B 52 results with the "plan-form" design,

. . . TNT Digs a Hole for

The Atomic Energy Commission resumed test explosions last week—but with TNT, not nuclear devices.

At the commission's Yucca Flats test site near Las Vegas, Nev., technicians set off 500 tons of chemical high explosive buried 125 ft underground.

The test was part of a series of high-explosive experiments being conducted to obtain information on the cratering effects of explosives for the AEC studies on peaceful uses of nuclear explosions.

Craters formed by surface or underground blasts could be useful in either construction or mining. Shattered or broken ground is more easily removed. And proper placement of a charge could actually move ground as might be needed for various purposes.

However not too much information is available on the effects of single point blasts, the category to which nuclear detonations belong. Single point blasts are completely different from conventional blasts used for mining or construction, where a series of charges is placed over an area then detonated with successive delays. The effects are bound to be substantially different from single point explosions.

Observation of last week's blast is expected to tell much about cratering effects. And much will be applicable to possible nuclear blasts.

But there is a more significant difference between the two types of blasts than simply size of the charge. Nuclear blasts can now be made quite small—less than 1,000 tons of TNT equivalent—and chemical blasts can be

Shelters as . . .

in which a depressed structure is made to conform as closely as possible to the shape in plan of the aircraft. Estimated cost is about $2 million per unit, about 25% of the cost of the plane.

A plan-form shelter for a B70 is much more difficult to design because large spans are necessary to bridge the delta-wing craft.

A new ASCE manual called "Design of Structures to Resist Nuclear Weapons Effect" was previewed.

As explained by Cmdr. H. L. Murphy, director, Navy Structures Program, Sandia Base, Albuquerque, N. M., the manual is intended for use in design of structures to resist in some degree all of the effects of a nuclear weapon—air blast, ground shock, and thermal and nuclear radiation. Weapons considered are in the multimegaton range (bombs equivalent to several millions tons of of TNT). Publication is expected late next spring.

A paper prepared by Brig. Gen. William E. Leonhard, Deputy Commander, Air Force Ballistic Missile Division, outlined the trend in protective construction for missile forces. The author showed the trend in protective construction is being utilized to provide effective and economical dispersal of missile weapon systems, based on the fact that adequate protection permits placing of launchers much closer together. This reduces the length of roads and other lines of communication.

The latest development is use of storable propellants and an in-silo launch capability.

Plowshare

made quite large. But 1,000 tons of TNT would occupy a sizable space while an equivalent nuclear charge might occupy a 30-in.-dia sphere. Also, the chemical blast is detonated in a millisecond as compared with a fraction of a microsecond for the nuclear blast.

Nevertheless, AEC scientists are convinced that much can be learned from the chemical blast that is applicable to nuclear work.

The present test series is part of the AEC Plowshare Program, which has been under way since 1957. There have been no nuclear explosions yet specifically for Plowshare.

The program is studying applications such as a civil engineering, production of isotopes and power, and development of natural resources.

Highest Embankment Topped Out

Trinity Dam, the highest embankment ever built and one of the top half-dozen in volume, has been completed in California by the U. S. Bureau of Reclamation.

The high rolled-earth fill has a structural height of 537 ft, and it rises 465 ft above stream bed. It contains about 33.2 million cu yd of earth, sand, gravel and cobble. The crest is 2,450 ft long, and the maximum base width is 2,962 ft.

The world's highest embankment for the last year or so has been Swift Dam, Pacific Gas & Electric Co.'s 512-ft-high earthfill on the Lewis River in Oregon. Trinity's status as the highest may also be short-lived. Oroville Dam, proposed as a major feature in California's Feather River plan, would be a 730-ft-high earthfill. It would set a new height mark not only for fill-type dams everywhere but also for U. S. dams of all types. Hoover Dam, a 726-ft-high concrete arch-gravity structure, is the highest dam in the country now.

Trinity is surpassed in volume by four Corps of Engineers dams on the Missouri River: Fort Peck, 125.6 million cu yd; Oahe, 81 million cu yd; Garrison, 66.5 million cu yd; and Fort Randall, 53 million cu yd.

Besides its distinction for height and size, Trinity Dam has also drawn attention because of its method of construction. Trinity Dam Contractors, the joint venture that built the dam, met the challenge of tremendous haulage volume and rugged terrain by installing a two-mile conveyor belt to carry the required 30 million cu yd of impervious fill material from the borrow area to the embankment. The belt cost $2 million (ENR Oct. 16, 1958, p. 30), but the contractor won his gamble that it would prove superior to a three-mile truck haul on an 8% grade, the alternative method of moving the material down the 1,200-to-1,500-ft drop from borrow pit to job site.

Trinity Dam is only one feature (the most spectacular, however) of a huge system to transfer water from the Trinity River, which flows into the Pacific about 30 miles from the Oregon border, to the Sacramento River, which waters the rich agricultural land in California's Central Valley. Other major units in the system are Lewiston Dam, Clear Creek Tunnel, Whiskeytown Dam and Spring Creek Tunnel. The system also includes Trinity Powerhouse, with installed generating capacity of 100,000 kw; Clear Creek Powerhouse, 134,000 kw; and Spring Creek Powerhouse, 150,000 kw. All three powerhouses are under contract.

Lewiston Dam, started this year, will be a 70-ft-high earth-rock-gravel fill diversion dam on the Trinity River for re-regulation of releases from Trinity Powerhouse and diversion of surplus Trinity water into Clear Creek Tunnel.

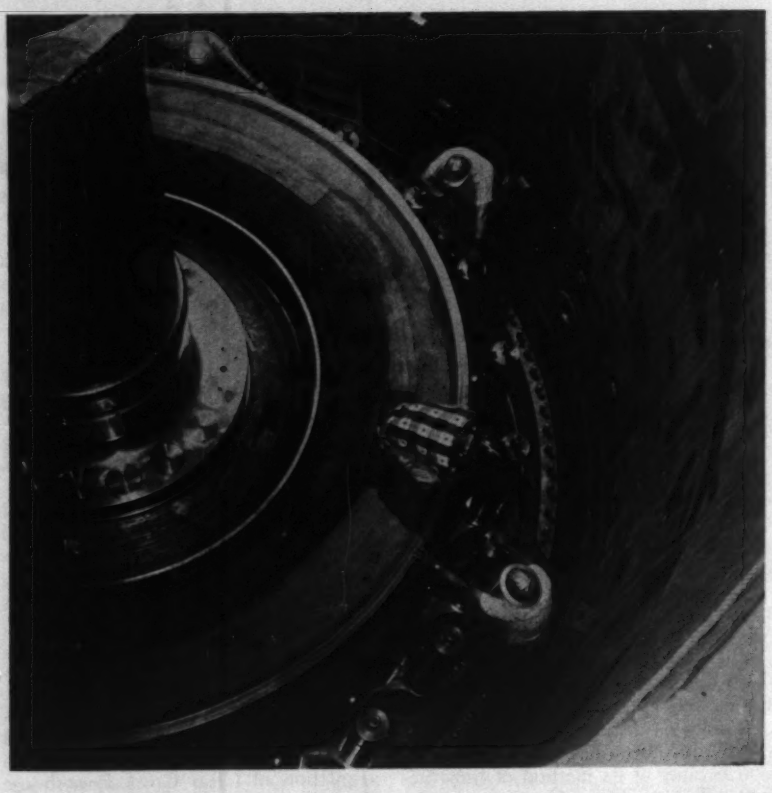
Clear Creek Tunnel, near completion, is a 10.8-mile 17.5-ft-dia conduit ending at Whiskeytown Reservoir.

Whiskeytown Dam, just starting this year, will be a 270-ft-high earth and rock fill dam on Clear Creek for re-regulation of Clear Creek Powerhouse discharges and regulation of runoff from the Clear Creek drainage area.

Spring Creek Tunnel, started this year, will be a 2.4-mile conduit 18.5 and 17 ft in dia, to carry water from Whiskeytown Reservoir to Keswick Reservoir on the Sacramento River.

Bidding and construction supervision of all the Trinity projects are under the Bureau of Reclamation's Trinity River Division, Lewiston, Calif.

Big Rotor Will Spin . . .



. . . At the Turn of Big Wheel

"Easy does it," was the word last week as workers (top) gently slipped this 595-ton generator rotor into place. It is the heaviest component of the No. 1 turbine-generator at Robert Moses Niagara Generating Plant—so named for the New York State Power Authority's chairman just two days before the big lift.

The huge rotor, first of 13 the plant will use, is 34 ft in diameter. It will be driven by a 50-in. shaft running in a thrust bearing that will support both the rotor and the 17-ft-dia turbine runner (bottom) for an approximate load of 850 tons.

A huge gantry crane that has been tested to 750 tons made the king-sized lift as Merritt-Chapman & Scott Corp., general contractor, entered the home stretch in its race to meet the Power Authority's deadline date of Feb. 10, 1961, for having first power on the line.

MC&S is building the 1,950,000-kw main generating plant of the Niagara Power Project for the Power Authority of the State of New York. The February deadline is three years from the award of the first construction contract.

Portland Voters Reweigh Pollution Control Plan

Portland, Ore., will make a third try at getting voter approval for financing improvement of its sewage-collection and treatment facilities. Expenditures of at least $7 million are needed to clean up the Willamette and Columbia rivers.

The Oregon State Sanitary Authority has a case in court to force the city to abate pollution of the rivers, and the U. S. Public Health Service has also threatened to move in on Portland.

Voters have twice turned down bond issues. But this time the city hopes a "pay as you go" plan of financing will gain approval at the polls. The plan would raise $1.4 million annually by doubling the present 35-cent monthly sewer usage surcharge tacked onto water bills.

Modern sewage disposal and treatment systems do serve most of Portland, but some outfalls still dump raw sewage into the Willamette and Columbia rivers.

Should funds be made available, the city plans new pumping facilities to reroute it to existing interceptor lines that carry the main load of sewage to the present treatment plant near the Columbia.

A second treatment plant is needed to handle the extra capacity of sewage and industrial wastes from an unserved area along the west bank of the Willamette River.

In its campaign to clean up the Willamette, the State Sanitary Authority has set a deadline of July 1, 1962, for seven communities between Salem and Portland to have secondary sewage treatment plants plus effective chlorination or its equivalent. Plans and financing arrangements must be ready by July 1, 1961.

Salem has requested a time extension until Dec. 15, 1963, to permit development of a $15-million regional sewerage project to serve Portland and its environs—an area of about 65 sq. mi.

Another Long Span for Britain Coming

With construction well under way on the 3,300-ft-span suspension bridge over Scotland's Firth of Forth, Great Britain is embarking on another project of closely comparable size—the long discussed suspension bridge over the Severn River at Bristol, England. The Bristol bridge will have a main span of 3,240 ft.

Bids were invited last month on a contract to cover the two main piers, the two anchorages and the east approach viaduct. Other contracts will follow on a schedule planned to bring the bridge to completion in 1965. The estimated cost is $30 million, and there is, in addition, a $14-million price tag on the approaches, which include a bridge over the River Wye in Wales.

Only a ferry now joins Bristol on the east side of the Severn with the road system in Wales on the west. In addition to its 3,240-ft main span the new bridge will have 1,000-ft side spans. The towers will be 470 ft high, and the roadway will provide a minimum clearance for shipping of 120 ft. The deck will be 118 ft wide to accommodate two 24-ft roadways, sidewalks and cycle paths. Total steel tonnage is estimated at 40,000 tons.

Consulting engineers for the Severn Bridge project are Mott, Hay and Anderson, in association with Freeman, Fox and Partners. Sir Percy Thomas is the consulting architect.

Snake's Potential: 80 Large Projects

Potential water resource development of the Upper Snake River Basin includes 80 projects with a construction cost of $1.6 billion, according to a preliminary report issued jointly by the Corps of Engineers' Walla Walla District and the Bureau of Reclamation. The projects include 46 reservoirs and 17 hydroelectric power plants. The potential capacity of the proposed plants would total 1.2 million kw.

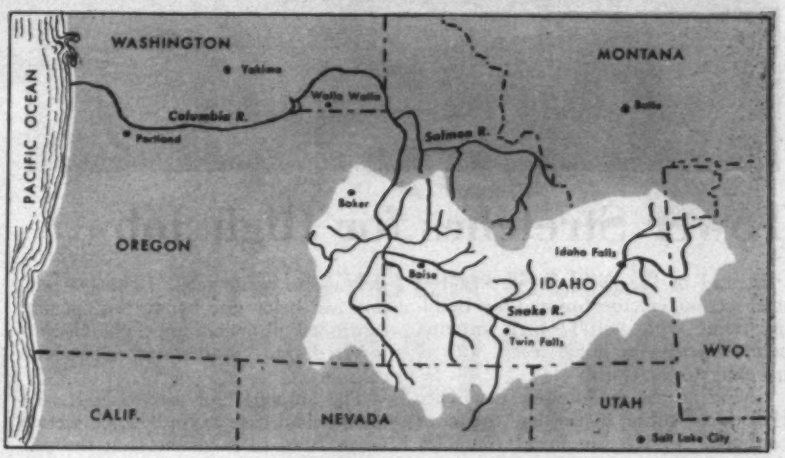
The over-all multipurpose development would irrigate more than a million new acres and provide supplemental water for another million acres. The reservoirs would have a total capacity of 7 million acre-ft. In addition to providing for irrigation, they would afford much needed flood control and increase recreational facilities.

The studies, started soon after preliminary hearings in 1955, are aimed at identifying unused and uncontrolled components of water and land resources in the Upper Snake Basin. Development possibilities to meet the needs of the area are also outlined.

The bulletin emphasizes that some of the development possibilities are not presently feasible or acceptable and may not come about for years.

The studies were undertaken in collaboration with other federal agencies, including the National Park Service, Fish and Wildlife Service, Public Health Service, Soil Conservation Service, and the Forest Service.

The study further states that, with ›ad growth as predicted by the Federal ›ower Commission, the proposed power



plants would fill the needs for only the next 20 years. In fact, irrigation pumping would consume about 35% to 40% of the power from the new plants.

This means that economical hydroelectric power development must precede or accompany the development of new irrigation projects.

The report says underground water resources will have to play an important role in any future land reclamation in some regions. The study indicates that in the portion of the basin east of Milner Dam, near Twin Falls, Idaho, all the surface water in dry cycles is already storable, appropriated and used for the present development. Future development "is now limited to the fairly difficult, intricate, and costly situations."

The most promising source is the ground water beneath the Snake River Plain. This underlies an area of some 13,000 sq mi, and serves as both a vast storage reservoir and ground water conduit. This could be used in future development in much the same way as a conventional surface storage reservoir and, in fact, would offer virtually evaporation-free storage.

This theory would involve use of surface storage during normal or wet periods and ground water during dry periods to develop this part of the basin.

A detailed summary report on the Upper Snake Basin will be available in the near future. Following release of this report, additional public hearings will be held, probably in December.

Tower Stretches for High Job

Instead of the usual flag-decked top steel section, erectors finished this building frame with a 100-ft-high antenna pole, making the long reach with a traveling tower crane.

Shape of the building—a new City Hall for Canton, Ohio—led the steel contractor to use the tower crane for the entire frame as well as the metal pole on top. At ground level, the building covers an entire block. Above this two-story base rises an eight-story tower.

With the 220-ft-high tower crane and its 75-ft boom, Valley Steel Erectors, Niles, Ohio, placed the entire 350 tons of structural steel for the base and tower. The crane operated on rails extending the length of the block front.

Design of the crane made it particularly adaptable to the Canton job, reports Louis Tripodi, head of the steel erection firm. The company leased it from Universal-Liebherr, Inc., of Zelienople, Pa., for the project. When work started, the crane operated with its telescoped mast in a lowered position. As construction progressed, the mast extended, raising the operator's cab as well as the boom-head. From his position just below the boom, the operator controlled all operations of the electric-powered unit from a single, two-lever console.

The antenna is a pair of 50-ft. sections bolted base to base. Each section tapers from 14-in. diameter at the center flanged connection to 9½-in. diameter at the ends. The assembly weighs 5,000 lb.

The lower section with a hinged base was lifted to the roof and pinned to a sole plate. With this part nearly horizontal, the upper portion was hoisted and held nearly level—in mid air—while a steel rigger inched his way out the pinned section to make the center connection. Then the crane lifted the mast into place.

Architects for the City Hall are Kelly & Gruzen. Ferrell Construction Co., Inc., is the general contractor. Both are Canton, Ohio, firms. Pittsburgh Bridge & Iron Works, Rochester, Pa., fabricated the steel for the project. Union Metal Manufacturing Co., Canton, produced the antenna.

$80-Million Titan II Base Up for Bids in January

The Corps of Engineers will invite bids early in January for construction of an $80-million Titan II base at Griffiss Air Force Base, Rome, N. Y.

The project will include 18 separate underground launching silos to accommodate two Titan II squadrons. Sites for the launching installations haven't yet been made. Griffiss AFB was chosen because it will not need any additional construction to support the outlying missile sites.

Griffiss AFB is the ninth and the last Titan base authorized under current Air Force planning. The nine bases will house 14 Titan squadrons in all. It will be the second ICBM base east of the Mississippi—Plattsburgh AFB, farther north in New York, will have launching silos for 12 Atlas ICBMs.

Bidding for the Griffiss AFB work will be limited to contractors prequalified by the Corps of Engineers Ballistic Missile Construction Office (ENR Oct. 13, p. 36).

Bids will be opened on the Griffiss ICBM project about 30 days after invitation. Construction is scheduled to begin 10 days after the contract award. Completion date will be 18 to 24 months later.

Unlike the early Titans, which had to be elevated from their underground housing to the surface for firing, the Titan II can be fired from its protective silo.

Philadelphia Colleges Plan $150 Million in Buildings

A $150-million program proposed last week by the West Philadelphia Corp. may become a detailed chunk of Philadelphia's master plan. The organization, which comprises five institutions in Philadelphia's "University City" area in West Philadelphia, is one of the city's quasi-public, nonprofit corporations formed to plan and promote urban renewal projects (ENR Oct. 13, p. 41).

Four colleges represented by the corporation plan to spend $100 million in their expansion programs. The remaining $50 million is expected to go into commercial and residential development and research laboratories.

The University of Pennsylvania's $50-million expansion program during the next 12 years constitutes the largest item in the proposal. The program would require an additional 90 acres within the expanded 230-acre campus. Small streets would be either closed or erased, and parking facilities would border the campus periphery.

Drexel Institute of Technology plans a $30-million expansion program during the next decade. Enrollments should climb from 8,500 to 14,000 in 1970.

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Around the World . . .

• **A-waste wells**—The Atomic Energy Commission is trying out a new system of atomic-waste disposal. Processed nuclear waste, liquefied and carried in a cement slurry, is forced into wells some 1,000 ft deep and released at various levels. The method could replace the present burial procedures for smaller radioactive particles. Bulkier materials would continue to be dumped at sea.

• **Revised code**—New York State has expanded its housing code to include ordinances covering mobile homes and mobile home courts. It also has been revised to conform to the format of the State Building Construction Code. Copies of the code are available from the Division of Housing, 270 Broadway, New York 7, N. Y.

• **Design competition**—The Copper & Brass Research Association, New York City, has started its third annual competition, but with a new wrinkle—first awards for both industrial and architectural applications of copper, bronze or other copper alloys. This way, products as well as material applications will receive their due. Entries close at the end of next March.

• **Overseas outlays**—A U. S. company will join with a British concern in the construction of two chemical plants to cost $20 million. One will be in England, the other in West Germany. Joint owners will be California Chemical Co., subsidiary of Standard Oil of California, and British Petroleum Co.

• **Railway loan**—The World Bank has allocated $70 million to India for improvement and expansion of her railway system under the second Five-Year Plan.

• **Istanbul for jets**—Ken R. White Consulting Engineers of Denver has a contract with Turkey to engineer and design a $25-million jet international airport at Istanbul. The contract also provides for 10 years of study and consultation to keep the airport abreast of developments.

• **Las Vegas shell game**—Construction is under way on a $4.5-million air terminal complex at Las Vegas. Main building is topped by three thin concrete shells.

• **South of the border**—A $350-million hydroelectric project is planned for the Uruguay River at Salto Grande. A dam about a mile long will be flanked by two 700,000-kw power plants—one in Uruguay, one in Argentina. Development and Resources Corp. of New York and an Italian consulting firm, Italconsult, have been selected to do preliminary engineering studies and designs.

• **Electronic traffic cop**—Fourteen closed-circuit television cameras are being installed along a 3.2-mile section of the John C. Lodge Freeway in Detroit. Officials will monitor the cameras in a central control room, where they can operate a signal system to ease traffic tie-ups.

• **FHA may 'win' Capeharts**—Government officials expect that within 30 days, lenders who financed $47 million worth of Capehart housing for Los Angeles contractor Hal B. Hayes will assign the mortgages to the Federal Housing Administration. Mr. Hayes was declared in default after stopping work four months ago. It also looks as though weather damage since then will add about $5 million to the cost of completion.

• **Instant bridge**—The Indiana State Highway Department plans to build a bridge over the Elkhart River, Noble County, in 24 hours. The department has to replace a damaged bridge, now shored up. A detour around the bridge would be 60 miles long. Use of 100-ft-long prestressed concrete slabs will save about 89 days over conventional construction.

• **Turnabout**—The same river that helped to wreck a Buffalo, N. Y., bridge in a storm (ENR Jan. 29, 1960, p. 24), helped erect a replacement. The Ernst Steel Corp. of Buffalo floated the 245-ft, 600-ton replacement down the Buffalo River to erect it on waiting towers.

• **Steam plant**—Construction of a $100-million steam-generating plant at Shiprock, N. M., is expected to start shortly. The plant will go up on an Indian reservation and will use Navajo coal. Its first stage includes two 175,000-kw steam generators. Utah Construction & Mining Co. and Arizona Public Service Co. proposed the project, and the Interior Department approved it.

Geothermal Steam Runs California Power Plant

A furnace that needs no fuel or stoking is producing enough steam to power Pacific Gas & Electric's new 12,500-kw plant in California. Geysers are the answer.

PG&E is the first American utility to cash in on steam from geysers or, in the parlance of geologists, steam fumaroles.

The $2-million geothermal plant at The Geysers in Sonoma County, Calif., is drawing steam from wells drilled into the volcanic geological formations, which are near the Earth's surface in the area. A pipeline carries the steam from the steam-well area down a slope to the turbine generator.

Steam wells were developed by Thermal and Magma power companies from whom PG&E buys the steam.

The geothermal steam, evident for over 100 years at The Geysers, shows little likelihood of being exhausted. Geothermal steam has been used for a long time at other locations. For example, power has been generated with volcanic steam at Larderello, Italy, for 50 years or more.

Perhaps the newest natural steam power plant to be put into operation before starting up The Geysers is in New Zealand. The first unit at Wairakei power plant, a $60-million development that will eventually have 252,000 kw installed capacity, started operating two years ago (ENR Apr. 30, 1959, p. 44). Construction of other geothermal plants in New Zealand is planned.

Wairakei wells range from 560 ft to 4,000 ft deep. Average depth is about 2,000 ft.

Johns Hopkins Combines Engineering Departments

Johns Hopkins University, Baltimore, has consolidated its civil engineering, mechanical engineering, and aeronautics departments into a new Department of Mechanics.

The merger developed as a result of increasing mutual interests by the faculty and students in the three departments, according to Dean Robert H. Roy of the School of Engineering.

The new department integrates instruction and research in all aspects of mechanics, including such subjects as material sciences, fluid and solid mechanics, geophysics, and space science. George Benton, former acting chairman of the Department of Civil Engineering, is chairman of the new department.

The Johns Hopkins move came as civil engineers—practitioners and educators alike—were discussing the future of engineering education at the ASCE meeting in Boston (see p. 21).

Thanks to ZEECON...

Mr. Norman Shute, President, Shute Concrete Products, Inc., Richmond, Indiana

"This concrete was so strong, so dense, we couldn't fire a bolt into it"

The pre-cast, pre-stressed seating channels (shown above) used in the Indiana University Stadium had to be extremely strong and dense. Specifications permitted only 2 to 4% air entrainment! To meet these requirements, Contractor Norman Shute used Eucon-WR, an additive that reduces water requirements through the action of Crown Zellerbach's Zeecon, a controlled dispersant for concrete.

"The additive worked so well", says Mr. Shute, "that we found it necessary to cast holes for the seat brace bolts; no powder actuated equipment could fire a bolt into it! Air entrainment was limited to 3 to 3½%. In every case we attained compressive strength of at least 3000 psi on the morning following pouring, allowing us to maintain uninterrupted production. Bleeding and segregation were greatly reduced, so our finishers were able to start to work sooner and finish faster."

For your next job, we urge you to investigate the advantages of additives containing Zeecon. For further information, write your nearest formulator or Crown Zellerbach.

ZEECON DISPERSANTS are available in a wide range of additives from formulators across the country. Formulations are available in set-retarding or non-retarding grades, with or without added air entrainment. Zeecon in formulations

- Reduces water requirements by 10 to 15%
- Improves workability
- Boosts compressive strength by 25 to 35% at 7 days, flexural by 10 to 15%
- Lowers permeability and water absorption of hardened concrete

For additional information write to your nearest formulator or to Crown Zellerbach.

■ *60 miles of seating channels* (shown installed at top of photo) were precast for the 55,000-seat Indiana University Stadium. Eucon-WR, a liquid additive containing Zeecon, was used with a Type 3 cement in a low slump mix to meet the rigid strength and permeability requirements.

INDIANA UNIVERSITY STADIUM, Bloomington, Indiana. SEATING CHANNEL CONTRACTOR: Shute Concrete Products, Inc., Richmond, Indiana. ADDITIVE FORMULATOR: Euclid Chemical Company, 19812 Redwood Road, Cleveland 10.

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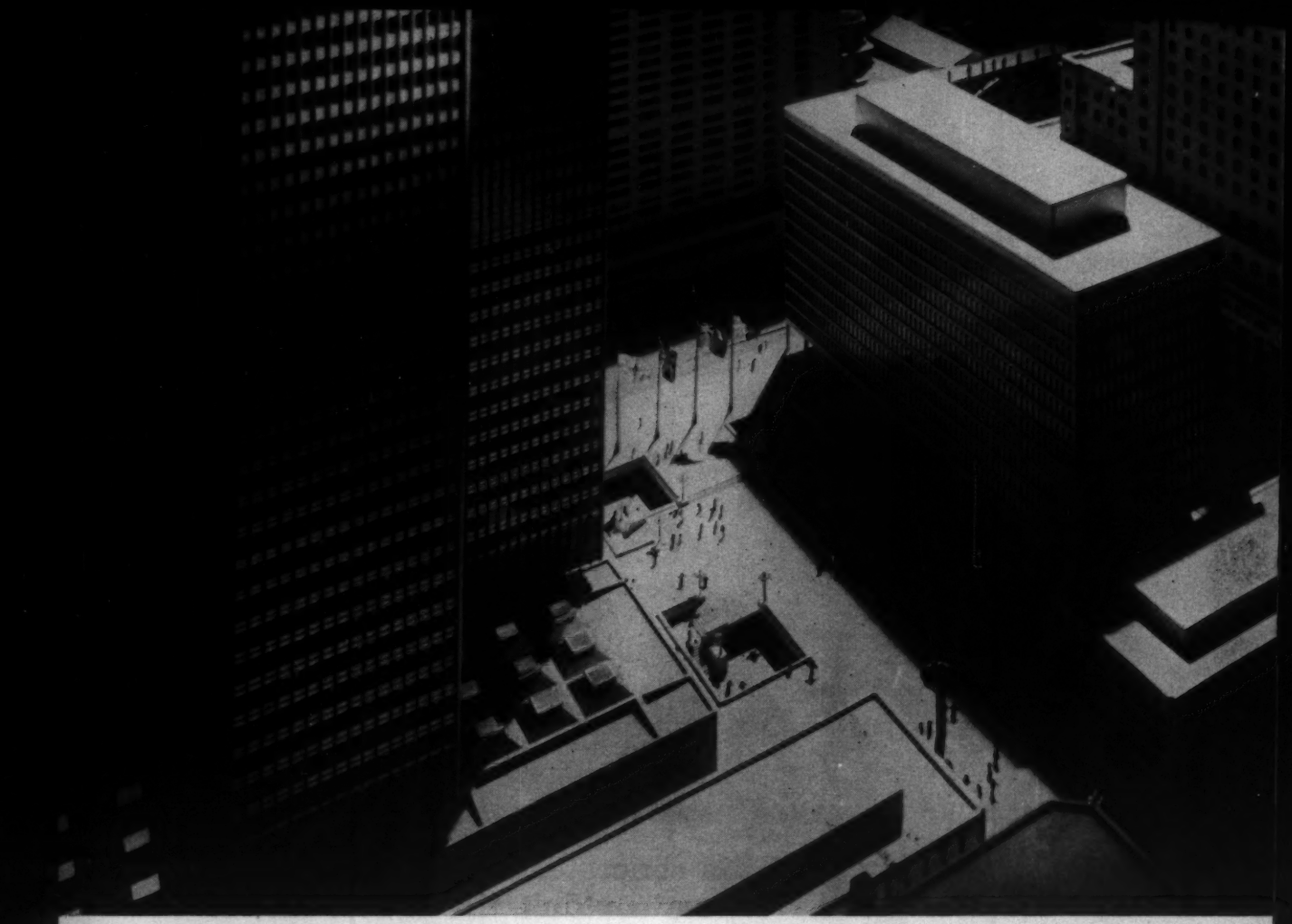
Econo-MIX
Super Concrete Emulsions, Ltd., 1372, East 15th Street, Los Angeles, California

CONEX
Wescon Products, Ltd., 3408 West 40th Avenue, Vancouver, B.C.

EUCON
Euclid Chemical Company, 19218 Redwood Road, Cleveland 10, Ohio

EZ-POUR
Western Admixture Company, 431 West 4th, Logan, Utah



New heart for an old city

Chassis-jolting jobs . . . up-to-the-hubs in mud jobs . . . round-the-clock, big-yardage hauls without a break or breakdown—that's the assignment of the Mack trucks on Montreal's giant new complex of buildings known as the Place Ville Marie project. Planned as a worthy rival to New York's Rockefeller Center, this ambitious project will give the city an outstanding example of city-center development . . . and a full-scale test of trucks and equipment.

Wherever you see Macks at work, their power and dependability set the pace. For dumpers, mixers, or any heavy-duty hauling, you can't beat them for staying on the job. The only time out they need is for routine service and maintenance.

Mack dumpers—with rated capacities from 4 to 14 yards—are built for enduring performance. Mack-built Thermodyne® or stock diesel engines range from 170 hp to 450 hp and deliver maximum torque at low r.p.m. . . . famous Mack transmissions—five to twenty speeds—have ideally spaced ratios to give drivers smooth effortless control through all speeds . . . Mack-engineered steering systems, famous for sharp turning angles and easy handling characteristics that enable Macks to maneuver faster, squeeze in extra trips per shift . . . Mack's unique Balanced Bogie with Power Divider—the four-wheel, rear-axle drive that delivers maximum power to the wheels with traction . . . these and many more features make Mack the performance and economy leader of the industry.

Your Mack branch or distributor will be glad to show you how to join the swing to Macks—the swing that means maximum hauling efficiency at minimum unit cost. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

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for over 7 straight years
NO. 1
by far in sales of diesel trucks

Over-all view of Place Ville Marie development in June, 1960. Mack mixers are handling the 72,000 yds. of concrete which will go into the 42-story central building.

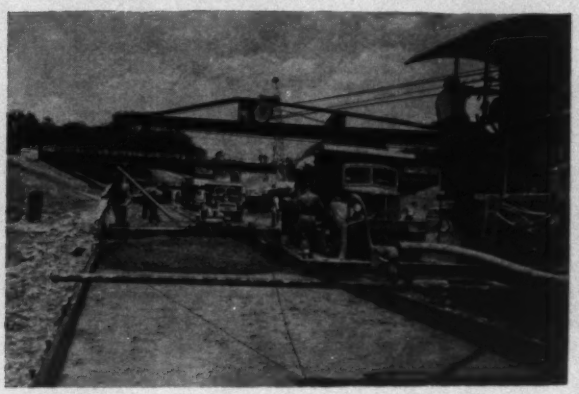
Steep pit pull-outs are a test of transmissions. Mack-built transmissions stand up to heavy-duty hauling far longer and need less attention than others.

Hub-deep in water, mud, or sand, Macks perform where other trucks often bog down—thanks to exclusive Mack Balanced Bogie with Power Divider that automatically transfers power to wheels with most traction.

Hinged sheet of wire fabric is placed and . . .

unfolded on New York paving project.

Arm on paver supports sprinkler pipe and . . .



cables for towing strike-off screed.

Hinges and Pipe Speed Road Paving

Hinged sheets of welded wire fabric and a novel rig for subgrade sprinkling are being used to speed construction of a concrete pavement near Monticello, N. Y.

Merritt-Chapman & Scott Corp., New York City, holds a $7,292,000 contract for an 8.3-mile length of divided highway, including a four-lane roadway, six overpass structures and guardrail. The contractor is paving at an average rate of 3,000 ft of 9-in.-thick, 12-ft-wide lane per 10-hr day, with peak production as high as 4,400 ft.

Hinged mats of either welded wire fabric or reinforcing bars have been approved for use in portland cement concrete pavements in New York State for years. Some fabric producers are now shipping the hinged product (ENR June 30, p. 45). MC&S's use of hinged sheets of wire fabric is the first major application in New York. An earlier installation was made last year near Philadelphia.

Principal advantages of the hinged sheets lie in shipping and handling. The reinforcing ability of the sheet is not affected by the hinge. Because the sheet folds almost in half, the shipping width is reduced from nearly 12 ft to about 7 ft, permitting delivery on flat bed trucks directly from plant to stock piles near the job site.

The contractor uses a flat bed truck to move the hinged sheets from his stockpile to pre-determined spots alongside the roadway. Because New York's Department of Public Works specifies a heavier weight and spacing of reinforcement for the two end sheets in each 60-ft 10-in.-long slab, the stock handlers place these heavier sheets approximately where required, with the hinged, lighter sheets spaced in between. In each slab the reinforcement consists of the two 8-ft-long end sheets, with three 16-ft-long hinged sheets between. Two men handle the sheets, placing them on the first course of concrete after initial strike-off.

The novel subgrade sprinkling device is a perforated pipe that extends across the 12-ft lane. It is mounted at the leading edge of and at right angles to the first paver in the train. Each time the paver moves forward after having deposited concrete for the first 6½-in. course, the operator opens the sprinkler valve and a fine spray of water covers the subgrade, just ahead of the previously placed concrete. The water is pressure fed from the paver's water supply.

The pipe support arm also carries tow cables for the initial course strike-off screed. The cables pass through twin sheaves at the end of the arm and are connected to a winch on the paver.

After depositing several buckets of concrete in front of the screed, which rides the forms, the paver operator winds up the tow cables and pulls the screed a controlled distance to strike off the fresh concrete. The screed carries vibrators set just inside the forms.

Project manager for MC&S is John Donovan; project engineer, Peter Arsenault; paving superintendent, Charles Harris.

Build faster and speed your payoff ...with STEEL

Steel buildings really go up in a hurry these days—three stories per week in a typical apartment house.

This faster construction, with steel, means faster rentals and a faster return on the owner's investment.

Look at this *added* payoff for steel construction on an apartment house with 1150 rooms renting for an average of $80 per month each.

Additional income for the owner:
1 month faster completion — $ 92,000
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Add this kind of *cash* bonus to steel's other proved advantages—strength, endurance and adaptability—and you just can't afford to build with anything other than **STEEL.**

American Institute of Steel Construction
101 Park Avenue, New York 17, N.Y.

Temporary columns support girder sections during erection.

Welded Plate Girders Span Risky

Bridging the Nisqually River for a major access highway to Mount Ranier National Park in Washington has been a real problem ever since the road opened.

The bridge site is located about a half mile below the present face of Nisqually Glacier. At unpredictable intervals, glacial till collects under the glacier to form an unstable dam. Water ponds in considerable volume, then breaks the dam and boils down in a surge estimated as high as 30 ft. With the water come boulders as large as 2 cu yd.

This almost irresistable force has demolished at least three bridges in the past 30 years.

Now a new Nisqually River Bridge, recently opened to traffic, has a superstructure beyond the height of all past surges.

Although one pier is within the high-water area, it is founded on solid granite, is 10 ft thick at the base and is armored with structural steel on the upstream face and both sides. It is expected to withstand future surges with only nominal damage.

The bridge features a pair of heavyweight welded plate girders—300-ft span; maximum depth of 16 ft 8 in.; web plate ¾ in. thick; and flange plates as much as 4 x 29 in. in cross section.

Original plans for the bridge called for a long prestressed concrete span; the over-all length of the prestressed unit of the superstructure was 440 ft (ENR Aug. 8, 1958, p. 25) and consisted of a 300-ft central span with a 50-ft cantilever on one end. The other end had a 90-ft cantilever, which supported one end of a suspended 100-ft concrete box girder span.

Later, it was decided to include an alternate plate girder design. The steel design was similar to the prestressed design, consisting of a 50-ft simple span, a 300-ft main span with a 75-ft cantilever, one end of which supported one end of a suspended 115-ft concrete box girder span.

All bidders submitted lower bids on the steel structure. Low bidder was Carl M. Halvorson, Inc., of Portland, Ore., at $1,164,186 for the steel structure and $1,243,280 on the prestressed design. This included $278,000 in grading items.

After winning the contract, The Halvorson organization, working with West Coast Steel Workers of Portland, developed a welded design to substitute for the riveted design. The substitute design also included a lightweight concrete deck with a 28-ft-wide roadway, a 3-ft-wide walk on one side and an 18-in. safety curb on the other. The lightweight concrete deck has a 1-in. wearing surface of regular concrete.

Substitution of the welded design for the riveted design, together with the change from regular to lightweight concrete for the deck, resulted in a saving of 118,000 lb of steel. The dollar saving was split between the contractor and the government for a decrease in contract price of about $16,000.

The 16-ft 8-in. depth of the girders made it impossible to shop fabricate them in full depth for hauling to the site; they were fabricated in half sections ranging in length from 40 to 61 ft.

Field assembly included a longitudinal joint weld made on the ground to join the half sections. Some of the vertical weld splices were made on the ground; others after the sections were erected.

In shop assembly, first step was to make the web-to-flange joints, which involve ½-in. fillet welds. After tack welding, the web and flange assembly was set at a 45 deg angle with the

Flange welds are made in shop.

Self-propelled machine makes web-to-flange welds.

River

weld made in two passes of a self-propelled welder.

Splices in the flange plates were also a critical welding operation. Both shop and field splices were made against double-beveled ends. A ⅛-in.-dia rod was used as a spacer between sections to be welded, and the gap was filled with multiple welding passes. Shop splices were expedited by use of a semi-automatic submerged arc welding gun, which deposits a continuous flow of granular flux over the arc.

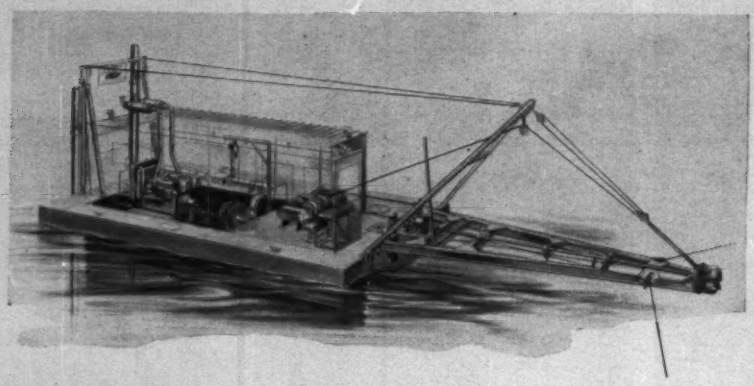
Stiffener plates 11/16 in. thick were welded to the ¾-in. thick web plate at 6-ft intervals by similar methods. The design also included a series of horizontal stiffeners placed at the third point on the compression side of the girder.

For better weldability, flange and web steel has controlled carbon content (ASTM, A-373). Stiffeners, bracing, bearings and expansion joints are made of ASTM A-7 steel. Extensive use was made of low hydrogen rod as well as iron powder rod.

Although almost all shop welding was done by automatic or semi-automatic method, field welding was done by hand. All main member tension welds and about 25% of non-tension

Girder halves are shop-fitted to assure easy job assembly.

The Most Advanced Dredges in Their Class



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welds were radiographed. In the early field weld stages many corrective welds were needed. But this condition was overcome when any weld not known to the erectors was required to pass prequalification tests.

Since the Bureau of Public Roads did not have available personnel sufficiently experienced at welding inspection, arrangements were made with the Portland U. S. Army Engineer District to provide inspection service for all welding. The district's materials inspection section is staffed with men experienced in the examination of heavy weldments used in fabrication of powerhouse and dam machinery.

While the shop fabrication detail was being worked up, the fabricator proposed making the large flange-plate welds by the thermit process. It was agreed to accept this process if full-size tests would prove the claims made for it were valid. Accordingly, 4x29-in. plates were thermit welded, cut into test sections and tested, both in tension and bending.

Although some specimens did pass the tension tests, most of the tests were complete failures. In those specimens that did pass the tension tests, it was obvious that the weld lacked ductility. So this method was rejected.

To supplement the bridge piers, four sets of falsework piers were installed during erection. Three of these were in the main span and one in the cantilever span. Each set of falsework piers included a pair of 3-ft-dia concrete columns. Because the erection work was carried on over two construction seasons—1958 and 1959—these columns were left in place over the winter with a successful calculated risk taken on winter storm flows.

Girders were assembled in the field before erection in sections up to 126 ft long weighing as much as 90 tons. Some of the lifts were made with a combination of guy derrick and heavy duty crane. Other lifts were made by a pair of cranes.

Nisqually Glacier Bridge was designed and construction supervised by the U. S. Bureau of Public Roads for the National Park Service. Design was accomplished in the Bureau's San Francisco office under H. R. Angwin, now retired.

The bridge's construction was supervised by Region 8 of the Bureau headed by B. M. French, regional engineer. R. P. Rodgers is BPR division engineer for the State of Washington.

Carl M. Halvorson, Inc., was represented on the job by F. C. Peters. West Coast Steel Works was represented by John G. Lundstrom, general manager, and John R. Gray, former chief engineer.

With national security at stake... missile base contractors fly

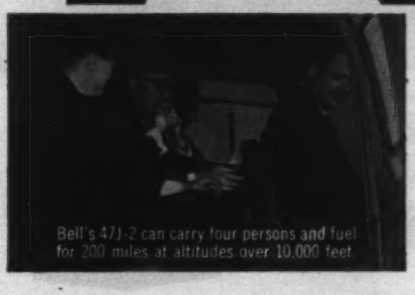
BELLS

There's a countdown underway throughout America as construction of our missile bases accelerates from day to day. Time is critical ... completion of the program is vital to national security and the Bell helicopter is *on the job*, speeding construction projects to completion *on schedule.*

One example: Western Construction Corp., on site at Lincoln Air Force Base, Nebraska, has turned "the impossible" into a time-saving reality by taking to the air in a Bell. Supervisors had been spending three days traveling by automobile to cover eight of 12 "hard" underground Atlas launching bases spread over a 500-mile road network. With their Bell, the same travel takes only two-and-a-half hours. Supervisory travel overhead has been cut 66 per cent.

Western has put a second Bell to work to gain double effectiveness. They've found Bell helicopters so dependable, so economical to operate and maintain that they expect full payout of their investment in one year. What's more, the high availability (99 per cent) of their Bells gives Western a time advantage unequalled by other types of transportation.

The helicopter is a natural for turning *waste time* into *pay-off* time in many fields of work. Let us send you full information on the Bell's total flexibility for your business. Write or phone: Commercial Sales Manager, Bell Helicopter Company, Dept. 7.7C, Fort Worth, Texas.



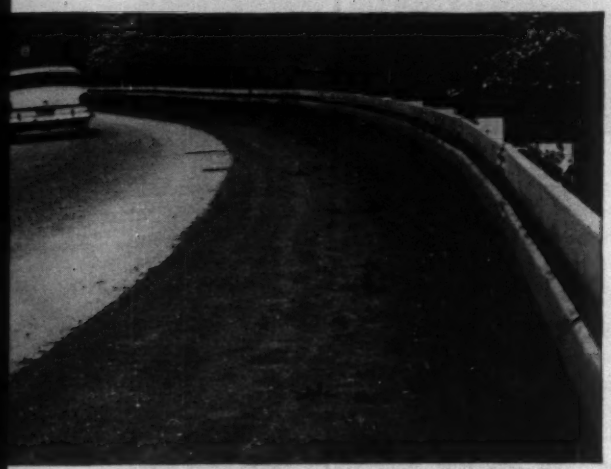
Bell's 47J-2 can carry four persons and fuel for 200 miles at altitudes over 10,000 feet

BELL HELICOPTER COMPANY

FORT WORTH, TEXAS • A DIVISION OF BELL AEROSPACE CORPORATION

University tests prove this steel guard rail has kept its strength

...after 20 years of continuous service



The first section of steel beam guard rail installed in Pennsylvania (in 1940) was selected for supplying specimen rails to test the strength of the steel after 20 years of continuous service.

Test rails were selected and removed, including one which was known to have been involved in a collision.

Here is proof that steel guard rail keeps its strength even after 20 years of continuous service in every kind of weather. In order to demonstrate that the strength of steel rail is *not* affected by time or the elements, a leading university made the following test:

Rails were taken from the first installation of steel beam guard rail in Pennsylvania, erected in 1940. All test rails had seen 20 years of service, with very little maintenance, and one was known to have been involved in a collision.

A test was set up at the university's research center in which the rails were subjected to loads applied in increments of 200 lb at the center of a 12 ft clear span, traffic-side up. Deflections were measured accurately.

Each steel guard rail tested passed with flying colors, remaining well within the test requirements. After 20 years of service, these rails had approximately the same strength as when they were installed. Further, the test indicates that notions about steel losing strength after long periods of continuous exposure just aren't true.

For detailed information about this test, write to us at any sales office, or direct to Bethlehem, Pa. And for more information on steel beam highway guard rail, ask for a free copy of our booklet 514.

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... Economy
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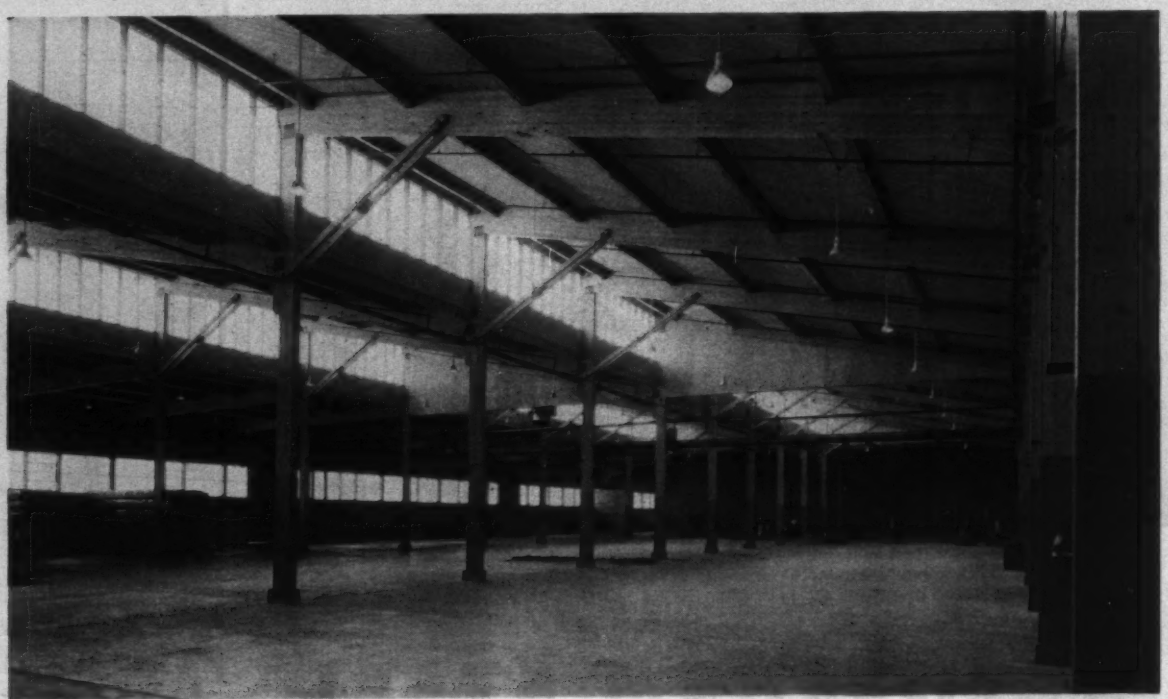
BETHLEHEM STEEL

At the university, the test rails were mounted so that loads could be applied at the center of a 12 ft span. Loads were in 200 lb increments and deflection carefully measured. Result: steel guard rail has approximately the same strength after 20 years of service as when it was first installed.

BETHLEHEM STEEL

Timber Frame Roof: Only $1.58

Trusses spanning warehouse combine bowstring and Howe designs.



Timber bents combine sawtooth and roof system in a single frame.

Per Sq Ft

Two types of trusses, combined in a single truss, and simple sloping rigid frames were used to form a sawtooth roof for a 152,000-sq-ft timber factory-warehouse built by the Port of Vancouver for the National Can Co.

Result: cost was only $1.58 per sq ft for the completed roof and structural framing system; total warehouse cost was only $3.75 per sq ft. The structure was erected in 60 days .

Feature of the 250x500-ft structure is a roof system over a 250x220-ft warehouse section that combines a half-bowstring and a half-Howe truss in a 125-ft span.

Unlike most sawtooth systems, which are superimposed on a regular roof frame in a sort of piggyback to provide clerestory lighting, the sawtooth bays in this building actually are the roof system. The frame consists of a sloping 7x26-in. glulam beam set on two 7x15½-in. glulam columns. These bents are spaced 20 ft c-c. The beams vary in length from 43 to 48 ft.

There are some bonuses from this type of roof system aside from the obvious one of economy.

- The system allows more usable headroom, because there are no low horizontal framing beams.
- Available lighting from the clerestory is increased.

The combination bowstring and Howe truss for the warehouse section was devised to reduce height of side walls and avoid valleys in the roof at the center. These combination trusses have glulam chords and webs. Douglas fir was used for the purlins.

The glulam columns of the center of the warehouse are 9x27 in. and 38 ft high. They were designed to carry wind forces, to eliminate knee bracing.

Another cost-saving feature is the use of 30-ft lengths of kiln-dried finger-jointed hemlock decking. This decking was laid diagonally across the purlins. Since it was finger jointed, it did not have to break on the beams, thus speeding up installation while providing a smooth roof surface.

Because lift trucks sometimes punch through light metal walls, the outer walls of this structure are solid wood, 6 in. thick, made by nail-laminating low-grade pieces of 2x6-in. cedar. Ribbed aluminum siding covers the outside. The wall is 8 ft high to the lower window.

Interior walls are plywood on a wood frame. Floors are concrete slab in the factory and warehouse, asphalt tile in the offices.

Western Engineers Consultants, Eugene, Ore., were the engineers.

It pays an engineer to remind himself that concrete can eventually break down . . . in major or minor degree depending on weather, corrosion or moisture pressure. When conditions are severe, no reminder is necessary, but somewhat more obscure is the need for high quality protective materials. Inferior coatings always cost more eventually. Since 1912, Standard Dry Wall, Inc. has been in no other business than the protection of masonry, and its products are leaders in the field. Thoroseal, for example, may be easily applied with our money-saving, long-handled brush, and will impart both a waterproof and decorative surface in gray, white or color. Write for our free specification folder on all Thoro System products.

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Prestressed concrete soldier beams . . . support the sides of drydock in which vehicular

Prestressed Beams Shore Drydock

Walls of a 473-ft-long drydock at Alameda, Calif., are of timber lagging supported by 50-ft-long prestressed concrete soldier beams. The drydock was built expressly to cast tunnel sections for the Webster St. Tube, which will carry automotive traffic under the estuary between Oakland and Alameda.

The new tunnel parallels the existing Posey Tube, completed in 1927, which pioneered the method of underwater tunnel construction using large precast segments. Since then, about a dozen other tubes have been built by similar methods.

Webster St. Tube is being built for the California Highway Department under a $16.6-million contract by a joint venture of J. H. Pomeroy & Co., Inc., Bates & Rogers Construction Co., and Ben C. Gerwick, Inc. It will carry two lanes of traffic from Oakland to Alameda. The Posey Tube, which now carries two-way traffic, will be converted to one-way operation from Alameda to Oakland.

Pomeroy-Bates & Rogers-Gerwick are building the drydock on the site of a World War II naval installation in Alameda. It is being used to cast the twelve 200-ft-long tunnel sections two at a time. The 54-ft inside width of the drydock is the size of the precast segments which are 37-ft o.d. with a 45-ft-square section at one end.

Original design of the drydock called for steel soldier beams. As there was no assurance of prompt delivery of the steel members, PB&RG engineers investigated prestressed concrete units. Prompt delivery of such members was possible and prestressed concrete turned out to be cheaper.

The 147 beams for the drydock were cast six at a time on a 340-ft pretensioning bed at the casting yard of Ben C. Gerwick, Inc., Petaluma, Calif.

A residual compression of 800 psi was imposed on each 20x30-in. beam by thirty 7/16-in. strands. Distribution of the strands over the beam cross section is nearly uniform. Some mild steel reinforcing is included at sections of the beam subjected to maximum bending moment. Use of reinforcing reduced the number of strands from 40 to 30. The beams were transported by truck some 50 miles from the Petaluma casting yard to the drydock site.

Workmen placed the beams on 6-ft centers in holes drilled in the sandy clay to a depth of 8 or 9 ft. The holes around the beams were backfilled with concrete to assure good contact.

As soon as the beams were placed, workmen connected ties rods to them. The 2¼-in.-dia steel tie rods are anchored at the middle of a 7½-ft-high by 16-in.-thick concrete wall cast 50 ft back from the drydock wall. The tie rods are made of high strength alloy steel and are attached to the prestressed beams 12 ft from the top. The anchor wall was constructed below natural ground surface so the rods could be level. And, as an added safety factor, the anchor wall was backfilled before placing a load on the drydock wall.

Also before the area behind the drydock wall was backfilled, the contractor cast the floor slab of the drydock. The slab is 1 ft thick except at the edges, where thickness is increased to 2 ft. Timber lagging 4 in. thick was placed behind the prestressed concrete soldier beams and the space behind the lagging was filled with ¼-to ⅜-in. pea gravel.

Purpose of the timber lagging and pea-gravel backfill is to make the area behind the drydock walls free draining to reduce the load that might be imposed upon the drydock wall in the dewatering process. The designers had considered watertight walls, but their massive nature would have made the

tunnel segments are to be cast.

Sheetpiling keeps estuary water from drydock excavation.

Walls

cost prohibitive. It was not possible to use any internal bracing.

The floor slab was cast on a 6-in. layer of gravel, and there is an underdrain system beneath the slab to eliminate uplift.

Bottom slab and sill of the drydock is located at EL-33 (mean low tide is at EL-3). Top of the drydock wall is at EL-18 and the tie rods are located at EL-4. The walls have a 12-ft free-standing cantilever at the top, then the tie-rod support, and 29 ft lower is the bottom slab support.

First step in construction of the drydock was to build a berm around the estuary end. The berm was made of mud and clay surrounding a sheet-pile wall. The berm proved to be watertight.

The contractor cast the drydock sill on top of a row of sheet piling. The first 60 ft of drydock wall is of cast-in-place concrete also on top of sheet piling. The purpose was to make a watertight wall at the estuary end to minimize water infiltration. The only water coming into the drydock excavation came from the land side of Alameda rather than the estuary side. This was handled by a 3-in. sump pump that permitted construction in the dry.

Walls are cast in place on the low sheetpiling at outshore end.

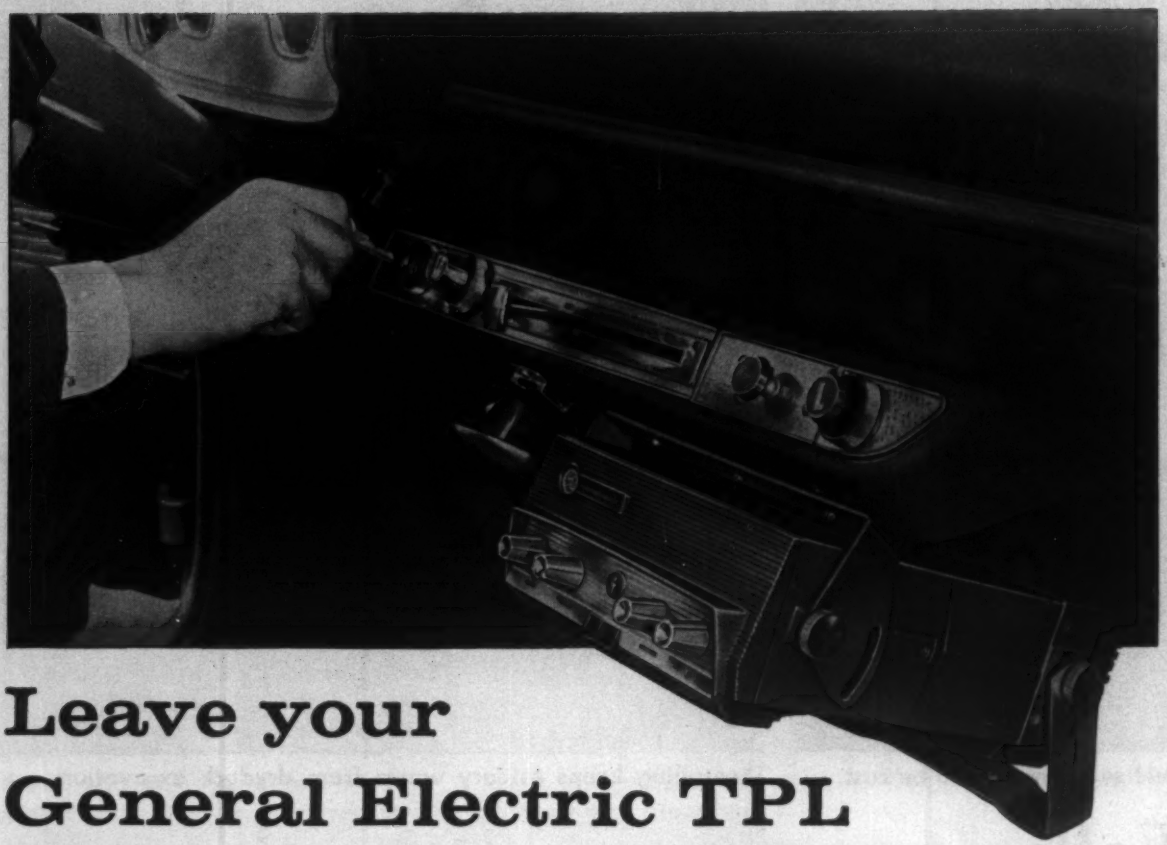
Last step in construction of the drydock was building the gate. Construction of the first two tunnel segments began before the gate was completed.

The gate is made of steel girders faced with sheet piles. Seal is provided by a half-circle rubber gasket. The gate structure will be lifted by a 75-ton floating derrick and moved to one side after the drydock is completely filled. Then the precast tunnel segements will be floated out.

The drydock will be filled through a pair of flood gates at the outboard end. Dewatering will be accomplished by a pair of 10-in. deep-well pumps. A pair of portal cranes services the drydock—one on each side.

The Webster St. Tube is a project of the California Division of Highways. George Greene is resident engineer.

For the Pomeroy-Bates & Rogers-Gerwick joint venture, Walter P. O'Farrell is general manager. The drydock was designed under the supervision of W. F. Talbot, Jr., chief engineer of J. H. Pomeroy & Co., Inc.



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Get the full story on TPL—the smallest, most reliable two-way radio you can buy today. Write General Electric Company, Communication Products Department, Section 10100-20, Mountain View Road, Lynchburg, Virginia.

GENERAL ELECTRIC

Concrete 'Dowels' Anchor Cliff

By A. E. Niederhoff

At the Kukuan hydroelectric project in the central mountains of Formosa, the Taiwan Power Co. is building an arch dam between canyon walls stabilized with reinforced concrete "pins" about 5 ft thick. These pins sidestep the need for digging out all the poor quality rock above the excavation for the dam proper.

The 280-ft-high concrete arch was designed by the French engineering firm of Coyne and Bellier. It has a spillway of four submerged vertical lift gates.

Formosa's rivers carry a great deal of silt after typhoon storms; reservoirs become silted up to the spillway crest in a few years. Live or usable storage of water has heretofore been limited to a depth equal to the height of the spillway crest gates. In the island's narrow river gorges this is sufficient pondage for only a few hours of daily running time for turbines furnishing peaking power to Formosa's combined thermal and hydro power system.

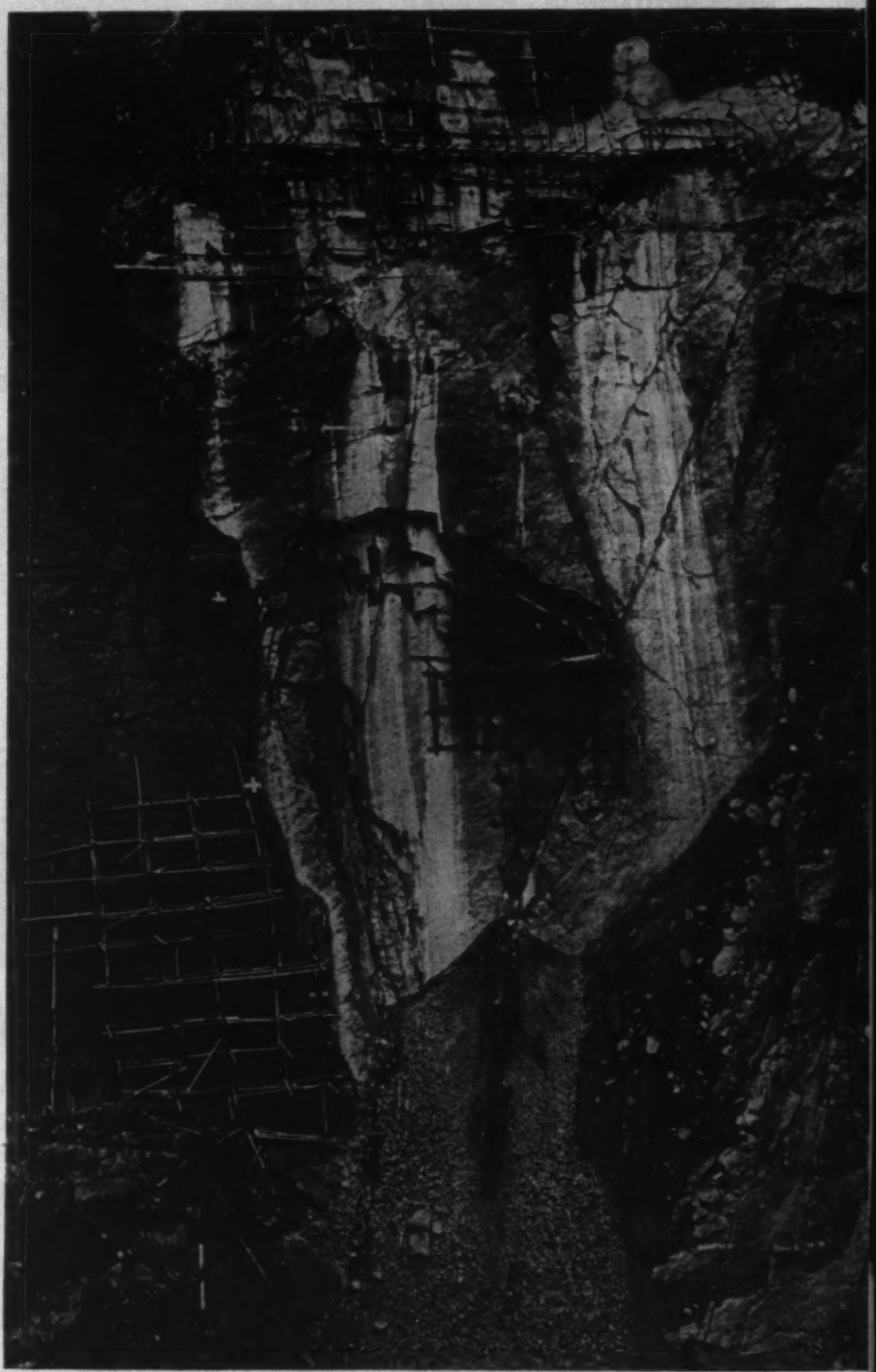
With the submerged spillway gates the depth of live storage is increased. At Kukuan, reservoir water will be stored to furnish five-hour peaking power daily during the driest 110-day period of record.

The four submerged gates provide for a design flood with a calculated probable frequency of once in a thousand years. An uncontrolled overflow spillway will furnish regulation of flows under 800 cfs. Each gate is 31 ft high and 21 ft wide.

The V-shaped gorge at the dam site contains sandstone and quartzite rock layers, ranging from medium to massive thickness and separated by thinner layers of slate. The dip of the strata on the right abutment is about 60 deg and extends upward from the river bottom to a height of 1,300 ft.

Before excavating the toe of these rock layers to sound rock, it was necessary to support the rock strata above. The first attempt consisted of rock bolting, adopting the same technique

Mr. Niederhoff was senior hydraulic engineer for the J. G. White Engineering Corp., New York City, when he worked on the Kukuan job. He has since joined Bechtel Corp., San Francisco, as supervising engineer in the power engineering department.



Workers on crude scaffolding bored 5-ft holes in cliff strata.

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OLD RAILROAD RAILS were used to reinforce concrete placed in dowel holes. Grout pipes, visible at top, had outlets near bad fissures.

used in tunnel work in the U.S., but on a large scale.

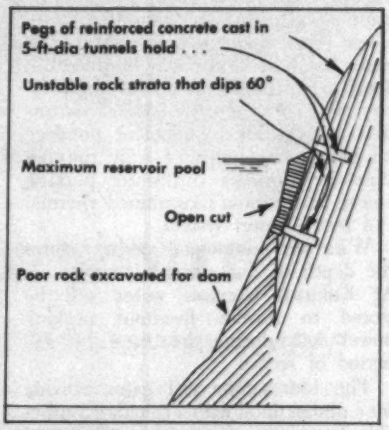
It soon became apparent that rock bolts would take too long to install and the cost would be inordinately high. A cheaper and faster means of pinning the unstable rock slabs in place had to be devised.

It was decided to drive tunnels through the rock strata above the top of the dam on about 30-ft centers and ranging from 20 to 50 ft deep. In cross-section, these short tunnels were about 5 or 6 ft high and 5 ft wide. Old railroad rails were placed in these holes to reinforce the concrete, which was subsequently used to fill the adits.

Steel grout pipes were placed in the crown and floor of the tunnels with outlets at all large cracks and fissures in the rock. Grout was introduced under very low pressures after concrete had set-up, further solidifying the layers to prevent initial movement. Thus a dam abutment resembling a deck of cards placed on end was pinned and cemented together.

The Chinese, like the Japanese, are excellent and fearless tunnel workers. They seem to glory in overcoming danger. They will drive tunnels into the mountainside high above the valley floor in nearly inaccessible locations. They work with such hand tools as star drills, sledge hammers, explosives, straw baskets, and broad-blade picks to scrape broken rock into the baskets. At Kukuan, once a portal is excavated for an adit, excavation progresses quickly through sheer manpower mucking out broken rock in baskets suspended from the ends of a shoulder stick.

The agility, ability and low pay scale of Chinese labor thus made the reinforced concrete pins less expensive and faster than the rock bolting scheme.


Pegs of reinforced concrete cast in 5-ft-dia tunnels hold . . .
Unstable rock strata that dips 60°
Maximum reservoir pool
Open cut
Poor rock excavated for dam

ALTERNATE METHOD would have been to excavate all unstable rock overhanging the dam excavation.

The project includes the first long pressure tunnel in Formosa. It leads from an intake at the dam site to an underground powerhouse three miles downstream. This concrete-lined bore has an inside diameter of 20 ft and was driven from three adits, each about 800 to 1,000 feet long.

Tunnel construction proceeded simultaneously with dam construction, but to complete the project on schedule, the contractors had to turn from abundant manpower to mechanization, heretofore unknown on Formosa.

The Kukuan tunnel was the first full-face tunnel driving operation on Formosa. Rock drills were mounted on hydraulically operated arms set in tiers on a rail mounted "jumbo."

After blasting, mucking machines

INSTANT SPACE

■ Don't expect packaged space to come in a glass jar. But simulated environments are available from Vitro which can duplicate conditions millions of miles away. Using its proprietary high-intensity arc, Vitro is designing a solar radiation simulator for the Department of Defense. USAF scientists will use it to expose coatings slated for space vehicle application. ■ The arc accurately represents the solar spectrum and energy distribution — importantly, from a single source. To date, this is Vitro's proven record of accomplishment: eleven major projects in which the simulation of unusual environment was vital.

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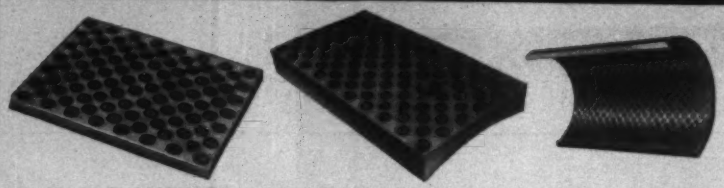
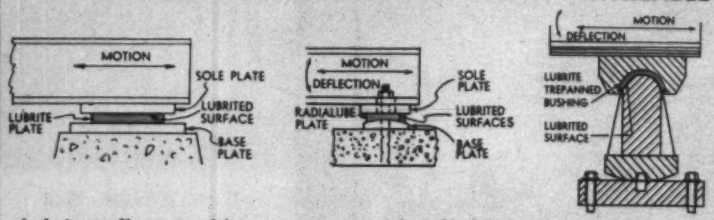


3 BASIC LUBRITE ASSEMBLIES FROM MANY AVAILABLE



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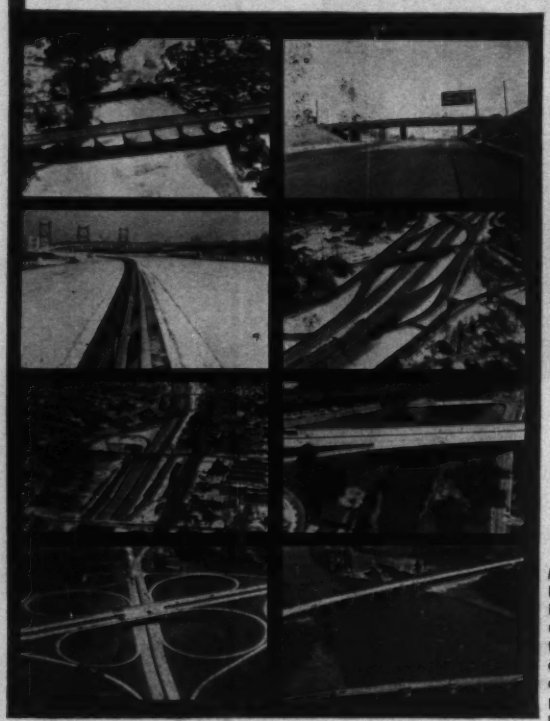

Manual No. 55 contains complete information, technical data and specifications about Lubrite Expansion Plates and Bushings for bridges, buildings, refineries, atomic energy and chemical processing equipment applications.

Manual No. 56 covers Lubrite bushings, bearings and washers for use in machinery, industrial equipment, hydroelectric projects, missile and atomic energy applications and high temperature applications.

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. . . International

loaded 4½-cu-yd rubber-tired diesel dump trucks.

The Kukuan hydro project represents international ability and cooperation of the first order. Chinese engineers and labor contractors are doing the actual construction; French engineers designed the arch dam and the intake and have a resident engineer on the job. Taiwan Power Co. engineers designed the pressure tunnel, underground surge tank, underground powerhouse and the tailrace tunnel. The J. G. White Engineering Corp. has a resident staff at the site to advise the Chinese. The initial two Francis tubines and vertical shaft generators, with a total rated capacity of 90,000 kilowatts at 570 ft head, were designed, manufactured and installed by a Japanese firm, Mitsubishi Heavy Industries.

Taiwan Power is building the Kukuan project under the economic cooperation agreement between the United States and the Republic of China. Work on the project began in 1957 and is scheduled for completion next March.

$5-Million Contract Let For Hangar at Vancouver

Trans-Canada Airlines has awarded a construction contract to Commonwealth Construction Co., Ltd., for a $5-million maintenance hangar at Vancouver International Airport as the first stage of a large terminal complex.

This first, main element of the base will be a steel-frame hangar with a 170x330-ft clear interior. Roof trusses will span the 170-ft depth of the hangar between individual columns at the rear to a pair of trusses at the front. The front trusses, each 165 ft long, will run from the sides of the building to a single column at the center.

The hangar roof will be steel decked with insulation and have a pitch-and-gravel finish. Clear height inside the building will vary from 50 ft at the front to 40 ft at the rear. Walls will be masonry block for a 5-ft height above floor level. Continuous window strips will be above. Upper walls will be insulated aluminum sandwich panels with a gray anodized exterior face.

Foundations will be expanded base concrete piles for the heavy column loads and untreated timber piles for the smaller loads.

The design provides for extending the hangar by adding bays along one side. Eventually, the base will hangar four DC-8 jetliners at one time.

Overall planning for the project is under TCA's chief architect E. W. Sellors, Montreal. Phillips, Barrat & Partners, Vancouver, are responsible for design and supervision of construction.

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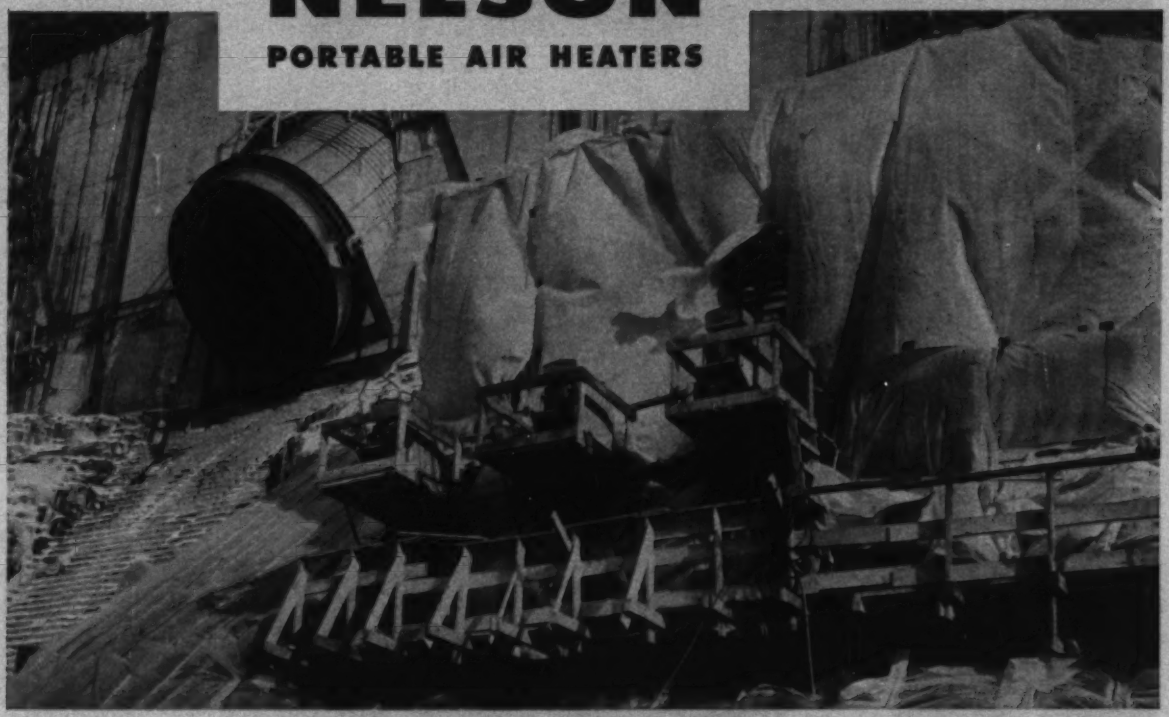

AT NIAGARA POWER PROJECT, world's largest hydroelectric facility, fifty Herman Nelson heaters are in use around the clock, seven days a week. In sub-freezing cold, temperatures are maintained at 50° to 60° F. for curing huge concrete pours and to keep workmen warm. Heat is directed through canvas ducts—up cliffside, down into pits, around corners. Heaters are standing up well under severest conditions. Contractor: Merritt-Chapman & Scott Corp.

MODERN OFFICE BUILDING near Albany, N. Y. moves into completion, protected from winter cold with reliable portable heat. Smoke, fumes are vented outdoors. The automatic "De Luxe" heater has capacity sufficient to heat 25 ordinary rooms. Contractor: Henry V. Rector, Inc.

$14 MILLION FREMONT CANYON Power Project in Wyoming used Herman Nelson "Thrifty" heaters for cold weather operations. Here, one is in use at concrete batching plant. Other "Thrifty" heaters were used day and night for curing concrete at powerhouse. Contractor: Coker, Kiewit, Cunningham.

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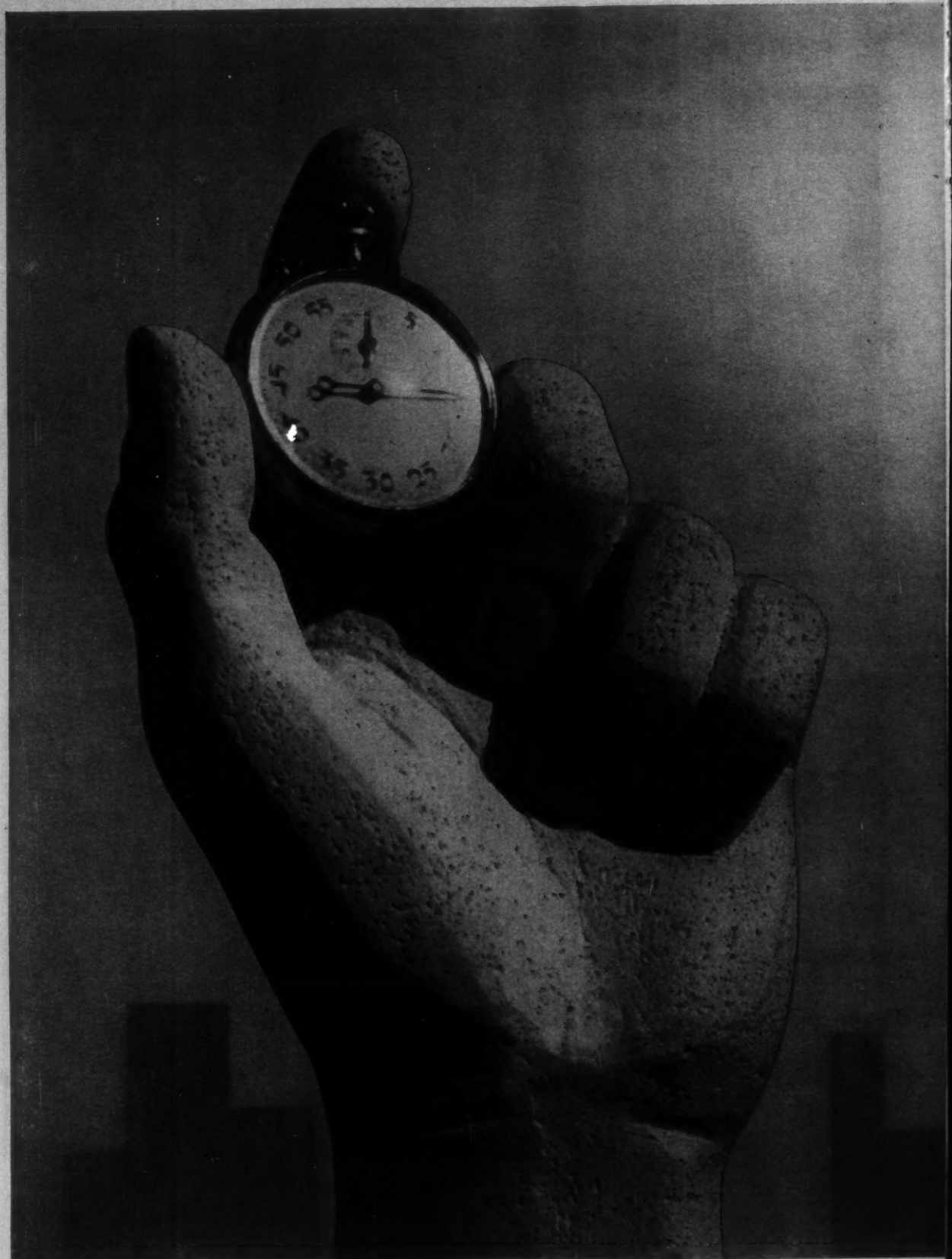

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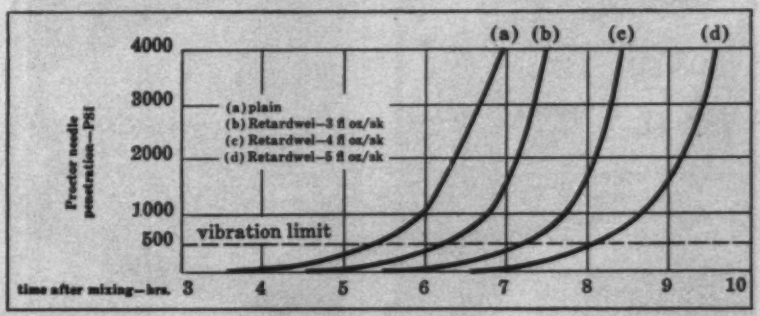
...the hot weather admixture that gives up to 50% higher 24-hour strength.

Retardwel®, a product of Johns-Manville, world's largest industrial user of portland cement, is the liquid admixture that controls concrete setting time and prevents premature stiffening due to high temperatures *without* loss of early strength.

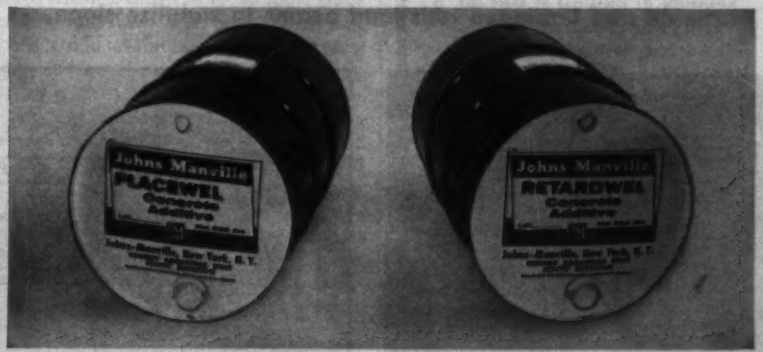
Retardwel permits a reduction in the water required for proper placing and provides all the advantages of concrete fabricated with a minimum paste content. Its use delays the initial set of concrete and provides a slower rate of heat evolution, thereby minimizing thermal stresses. Therefore, the use of Retardwel will aid in eliminating shrinkage cracks. Only 3 ounces of Retardwel per sack of cement will control setting time (see chart) and still increase 24-hour strength as much as 50%.



Retardwel's unique properties will also—

■ Increase durability ■ Improve dimensional stability
■ Increase workability ■ Reduce permeability ■ Increase density

For normal weather conditions, J-M Placewel® is recommended. Johns-Manville's two concrete admixtures have gained the acceptance of architects and engineers throughout the world. For full information write: Johns-Manville, Box 14, New York 16, N. Y.



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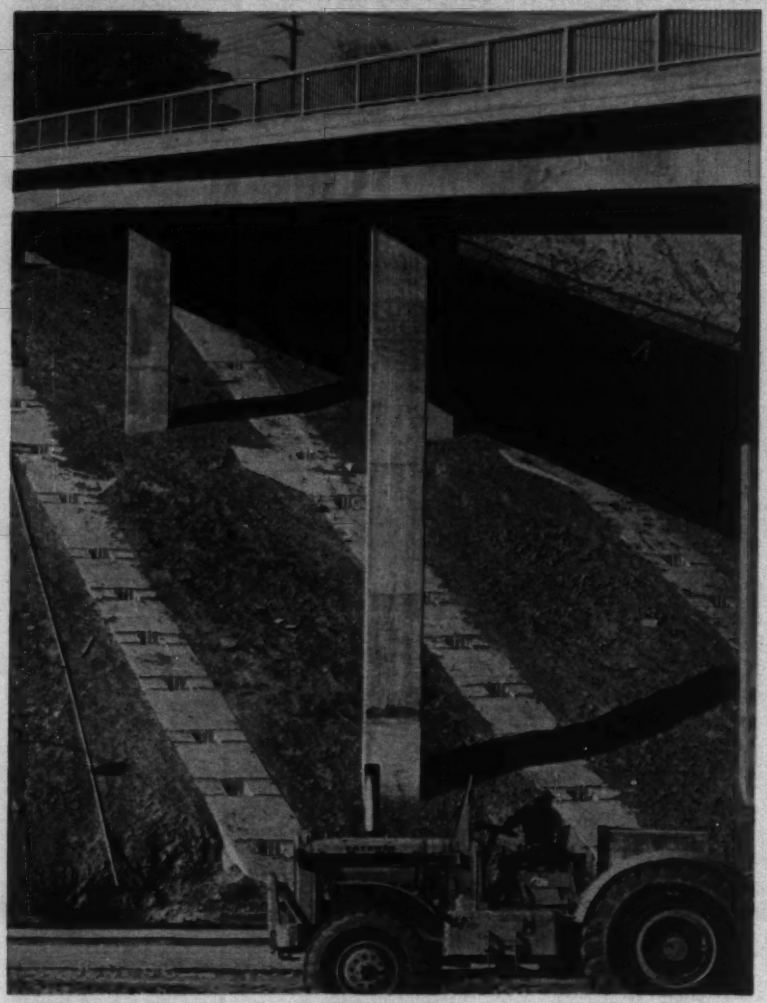
Cut Slope Is Prestressed With



Anchored and tensioned rods load beams to stabilize slope.

The California Division of Highways used prestressing equipment and techniques normally associated with concrete structures to stabilize a cut slope at one end of a bridge in Walnut Creek, Contre Costa County.

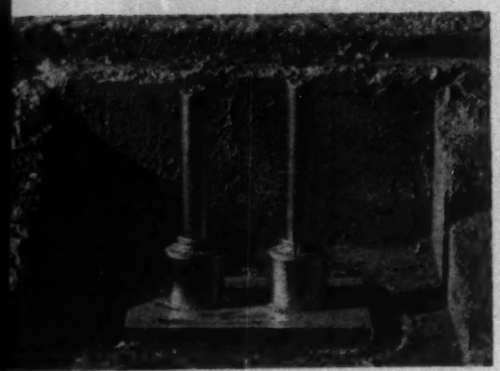
The bridge is a 291-ft-long, five-span concrete structure supported by abutments and four reinforced concrete, two-column bents. All the foundations were originally designed as spread footings; footings for one abutment and two bents would have rested on the 2:1 cut slope.

Although the bridge is located in a slide area, preliminary borings revealed no unusual conditions, and engineers prepared the spread footing design.

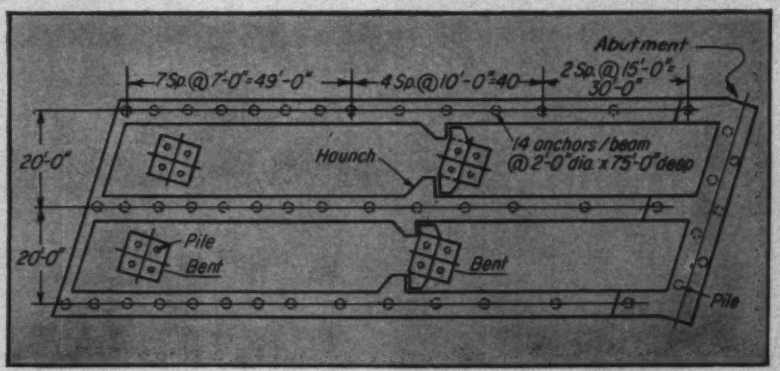
Excavation was started, and when about 35 ft of earth had been removed, damp spots were noticed in the vicinity of the bridge site. At first, the damp areas dried up at the surface, and it appeared that nothing unusual would be encountered. However, as more earth was removed, the water in the ground was able to flow because of the lower soil pressure. Soggy areas appeared, seepage developed in the slope, and there were several small slides.

Engineers suspended construction operations and called for additional borings. Investigation disclosed a potential circular failure plane passing below the new roadway at the toe of the slope, deep beneath the bank and through an old road at the top of the cut, beyond design location of the bridge abutment.

Flattening or terracing of the slope was not practical because of right-of-way limitations. Engineers also decided that drainage could not increase stability to a safe value. The final decision was to stabilize the slope by stressing it.



Nuts, plate hold rods in tension.



Beams are anchored top and bottom; haunches prevent sliding.

Beams and Anchors

Designers also changed the foundations of one abutment and the two adjacent bents from spread footings to piles.

To apply load to the slope, engineers used three reinforced concrete beams 1 ft 3 in. thick and 5 ft wide. The beams extend from top to bottom of the slope; they are anchored to the abutment at the top and to a tie beam at the toe. Spacing of the beams is 20 ft c-c.

Load is applied to the beams through high-strength alloy steel rods 1⅛ in. in diameter and about 75 ft long. Fourteen pairs of rods load each beam; eight pairs are spaced at 7 ft c-c, four at 10 ft, and two at 15 ft. Each rod is stressed to about 50 tons. Resulting load on the soil is about 3 tons per sq ft where pairs of rods are on 7-ft centers, 1½ tons per sq ft for 15-ft centers.

To install each pair of rods, the contractor drilled a vertical, 24-in.-dia hole to the required depth. Each rod was covered with a protective layer of mastic and encased in a 3-in., 26-gage galvanized pipe to prevent corrosion and bond to concrete. At the bottom of the hole, rods were seated in 7x10x1⅛-in. steel plates welded to special supporting chairs. A Howlett grip nut was installed at the lower end of each rod to restrain the rod from pulling out of the anchor and permit later application of stress.

Because of difficult working conditions on the slope, each rod is made up of three individual lengths held together by Howlett grip couplers.

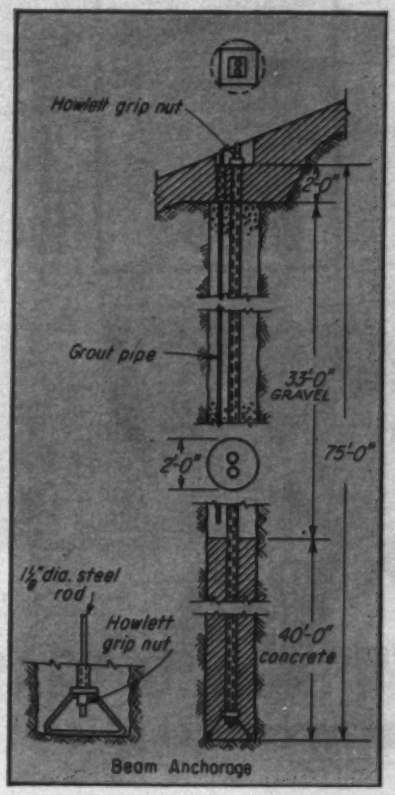
With the two rods in position in each hole the contractor grouted the hole to a depth of 40 ft. He then placed 33 ft of gravel on top of the concrete.

At the top, rods pass through a steel anchor plate embedded in the concrete beam. A Howlett grip nut was fitted on the top of each rod.

At the location of each pair of rods, designers altered the beam cross section to provide a strong step or haunch. The haunch provides 25 sq ft of bearing area of the beam in contact with the soil at the location of the concentrated loads. Additional haunches at about mid-length of the beams prevent movement downward along the slope.

As soon as the concrete had attained adequate strength, the contractor stressed each rod to 10 tons, using an hydraulic jack with 100-ton capacity. Stressing began at the lower ends of the beams and progressed upward until each rod carried a 10-ton load.

The process was repeated—building up the load on each rod by 10-ton increments—until each rod was stressed to 50 tons. Later, 50-ton loads were again applied to compensate for any losses due to settlement or other factors.



Drilled-in concrete piles anchor rods.

Three weeks later, the contractor again stressed each rod to 50 tons. Ends of the rods were left exposed so that loads could again be applied if necessary. Observations indicate that little or no settlement has taken place.

Engineers redesigned the foundations of the abutment and two bents on that side. They provided a reinforced pile cap 2 ft thick in each location, and 15½-in. diameter cast-in-drilled-hole concrete piles. Piles are 30 ft long beneath the lower bent and 40 ft long beneath the upper bent and the abutment. Footings also were haunched to prevent down-slope movement.

General contractor on the project was Charles L. Harney, Inc. Drilling was done by Geo. F. Casey Co. and steel was placed by Gilmore Skoubye Co. Prestressing materials and equipment were furnished by Rods, Inc., Berkeley.

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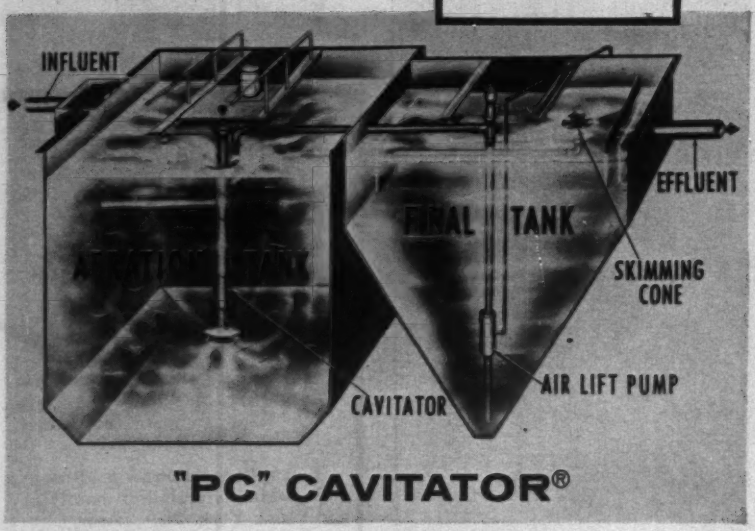

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Airlift Across Steep Canyon Speeds Site Exploration

A helicopter does the heavy work during feasibility studies at the controversial Nez Perce Dam site in the deep Snake River gorge.

Rock drilling crews are taking core samples and the helicopter helps out by moving heavy equipment—loads averaging 500 lb—from one side of the canyon to the other. In one three-hour period the craft made 50 trips, a job that would have taken months over land.

With his view of the ground directly below blocked by the helicopter itself, the pilot was guided by hand signals from a man stationed on a ledge on the canyon wall.

Nicholas & Thompson Drilling Co. is making the tests, which are in part a check on earlier geologic studies on the site of the proposed 700-ft-tall concrete arch dam. The company is under contract to Washington Public Power Supply System, an applicant before the Federal Power Commission for a license to build Nez Perce Dam. (ENR Sept 15, p. 24)

Project: Indianapolis City-County Building
Owner: Indianapolis-Marion Building Authority
Architect: Allied Architects & Engineers, Inc., Indianapolis
General Contractor: Huber, Hunt & Nichols, Inc., Indianapolis

SAFE TEMPORARY UNDERPINNING NEEDED:

Here's how alternate pit plan solves problem economically

Excavation requires 50,000 sq. ft. of sheeting

10"—42# steel beams brace underpinning

Indianapolis desired to occupy the above-pictured City-County offices while erecting Section I of a new home on the adjacent lot. The existing structure would then be demolished and replaced by Section II of the new building.

Prior to its demolition, some means of temporarily supporting the massive old edifice was required. After study of soil conditions, Spencer, White & Prentis devised a system of intermittent underpinning pits which solved the problem without need of a continuous underpinning wall (as had originally been contemplated).

The pit system, going 20 ft. to subgrade, provided a safe and dependable – as well as an economical – method of carrying the heavy load. The award to Spencer, White & Prentis also included 50,000 sq. ft. of horizontal wood sheeting used for bank support. Catalog on request.

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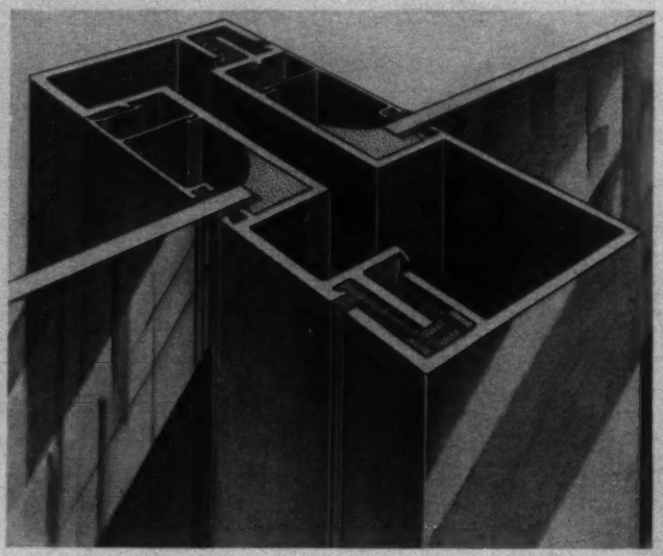
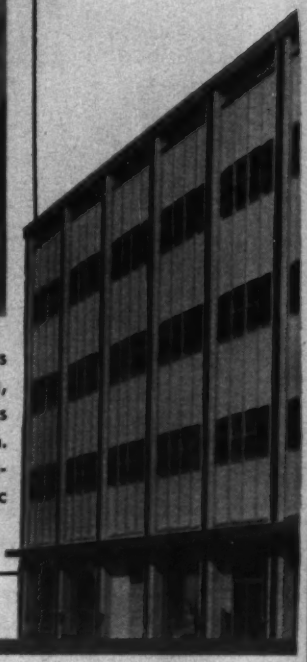


PERSPECTIVE VIEW SHOWING the Amarlite® Trimline Wall, Series 808, made by AMERICAN ART METALS COMPANY, Atlanta, Georgia, selected for the Meridian Building because of its strong characteristics of watertightness under all conditions of expansion and deflection. Erection was made easily and quickly; glazing was very simple. Extrusions are Revere Aluminum. This curtain wall is but one of many basic designs available from AMERICAN ART METALS COMPANY.



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used in curtain walls of

Selection by AMERICAN ART METALS COMPANY based on necessity for maintaining critical tolerances . . . with a 3-week delivery date from day of design.

There was no margin for error when American Art Metals Company placed its order with Revere for 81,000 lbs. of Aluminum extrusions. They wanted them good and they wanted them fast! Those 30 new extrusions had to be perfect the first time. The Revere Mills showed their appreciation of this kind of confidence by delivering the goods . . . in perfect condition, and on time.

Steps were: from design, to engineering, to die prints, to the making of 30 new dies, to extruding the metal and shipping . . . total time 3 weeks.

The curtain wall used on this job was Amarlite Trimline Wall, Series 808, made by American Art Metals Company, Atlanta, Georgia. They report that even under the driving

Architect: GILBERT M. FEIN & ASSOCIATES, Bay Harbor Islands, Miami Beach.

General Contractor: RICHARD S. FLINK, INC., Miami Beach.

Curtain Wall Manufacturer: AMERICAN ART METALS COMPANY, Atlanta.

Glazing and Curtain Wall Contractor: ADAMS GLASS SERVICE, Miami Beach.

Aluminum Extrusions

Meridian Building, Miami Beach, Fla.

rain conditions during the past winter the performance of the wall has been excellent, crediting the high quality of the Revere Aluminum Extrusions used with helping to make possible this kind of performance.

The unique vinyl inserts between the halves of the 808 mullion provide a thermal break, insulating the interior part from the exterior part, and also accommodate horizontal and vertical expansion. This permits the inevitable expansion and contraction without the loss of water-tightness and without the noisiness of metal-to-metal movement. All fastenings are concealed, and mullion faces, outside and inside, are seamless.

Architects, engineers, contractors, manufacturers . . . why not call in Revere for consultation on the buildings you are now planning? It's entirely possible Revere's Technical Advisory Service can help you with your problem in the same way they have served such organizations as American Art Metals Company.

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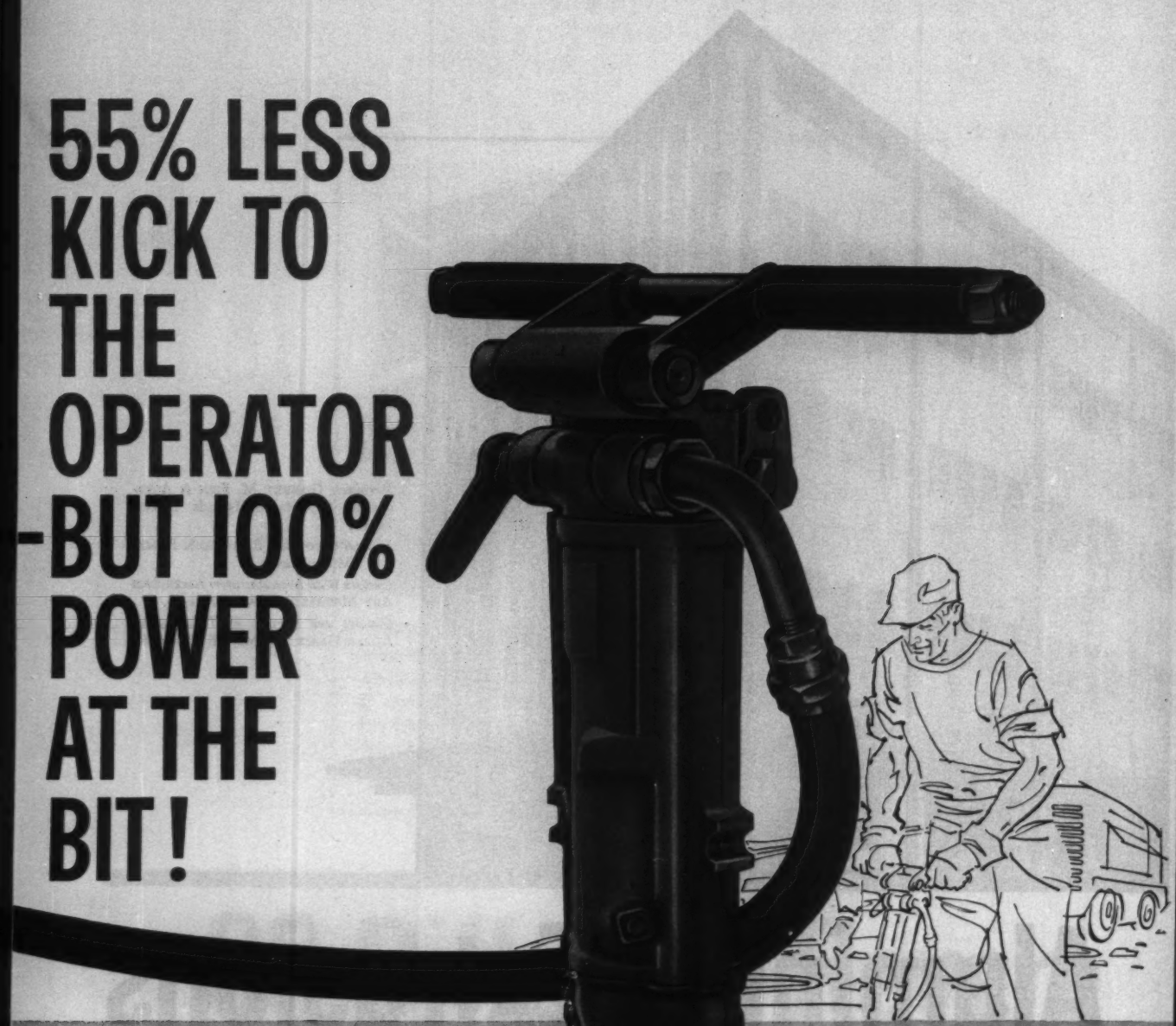

Le Roi Shock-Absorbing Sinker Drills

If you want to see a startling increase in drilling footage, equip your drillers with Le Roi shock-absorbing sinker drills!

Le Roi's rubber-cushioned torsion handle absorbs 55% of the bone-racking, brain-rattling shock doled out by ordinary drills. The result: Drilling output soars because workers can concentrate on operating the drill — *not fighting it!*

There's more. Exhaust is directed *away* from the operator. Swivel-type air connections ease maneuvering — and latch-type retainers simplify tool changes. Lap-finished mating surfaces and positive oiling improve tool efficiency and extend service life.

Let your drillers try them. Call your Le Roi distributor — or write to Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin.

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AT-54

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Contractors preview Skooper, not yet in production.

Pilot Loader Ready for Tests

Contractors invited to the Koehring Co.'s proving grounds west of Waukesha, Wis., last month saw a pilot model loader that's yet to be job-tested. It was shown along with 40 other major pieces of Koehring equipment, put through their paces at testing areas.

The pilot model loader, a fully revolving, crawler-mounted job, is called the Model 505 Skooper. It is so new that few details of its design are available. But it would appear to be a big brother of the 2-cu-yd Model 205 Skooper introduced at Koehring's equipment show two years ago (ENR Oct. 2, 1958, p. 47).

Present plans are to job-test the new loader on construction in the Milwaukee area this winter and next spring, then go into production with it by next July. It will mount a 4½-cu-yd general purpose bucket; a 3½-cu-yd bucket for rock; and a 5-cu-yd bucket for rehandling material.

It is a stand-still type loader (crawlers are stationary while loading.) It has a 10-ft-4-in. crowd length and a 45,000-lb crowd force.

Loading height is 13 ft, the hydraulic system operates under a pressure of 2,000 psi, and there are independent controls for swing and travel.

Why Buy Windows for Schools?

Why bother with windows in new schools?

Researchers and designers are looking at the simplified "block" school and deciding they can cut perimeter wall cost even further, reduce maintenance some more, make heating and air conditioning easier and keep the student's attention on his work—all by leaving out the windows.

That's a conclusion of a research project on school design sponsored by Carrier Corp. Teachers and designers engaged in the study acknowledged that many of their conclusions are controversial. But cost comparison figures between a Houston school and a designed windowless counterpart indicated a dollar saving of more than 20%. And firm plans to build a windowless school in South Park, Tex., confirm acceptance of the system and the cost estimate.

The three-story Houston school was built in 1954. Houston architects Goleman & Rolfe, designed their windowless counterpart as part of the Carrier project. Construction figures, keyed to January, 1960, costs, came out $2,744,033 for the actual building and $2,163,156 for the one-story, windowless design. And the lower cost includes air conditioning, which the actual building doesn't have. Cost figures come from estimates made by Construction Service Co., Ft. Worth.

The South Park School, also designed by Goleman & Rolfe, will be almost an exact half-size copy of the windowless Bellaire design. The 850-pupil school must be ready for occupancy by

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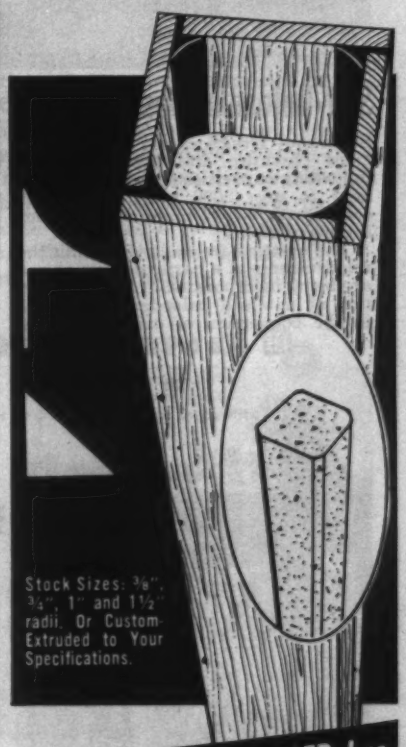

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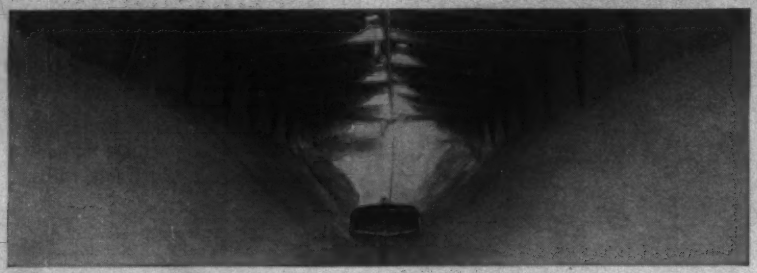


Self-Unloading Vessels

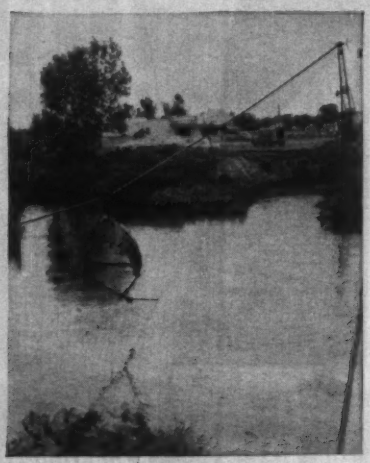
Sauerman DragScrapers provide efficient clean-up and low-cost cargo unloading capacities from 100 tph. (or less) to over 2000 tph. They are a component part of many ship unloading installations.

The systems are designed to suit the requirements of a particular vessel and are being incorporated in the construction of new self-unloaders as well as in the conversion of existing vessels.

DragScraper unloading allows maximum space for cargo stowage. The cargo rides low in the hold providing greater stability and increased carrying capacity over cargoes which are hoppered high.

Sauerman ship unloaders are economically handling rock, ore, sand, coal and cement. One man controls the entire operation from a convenient station overlooking the hold and away from any hazards of material or working area.

(Condensed from Marine Brochure MB-1)



Digging a Trench Under Water

Digging a trench across the Big Calumet River was economically handled by a ¾-yd. Crescent DragScraper used with a ½-yd. crane. The crane's hoisting line was used as a track cable for the DragScraper and single wheel carrier. This cable was dead-ended on the opposite shore.

To permit gravity return of the DragScraper, the crane was placed upon a built-up mound of dirt and the boom raised to its highest point. Spooling capacity of the crane's load drum was just enough to allow the DragScraper to dig the trench the width of the river. Depth of the trench was about 6 ft. at an average depth of 12 ft. below water.

(Condensed from Sauerman News No. 151)

Handling Phosphate Ore

Ore concentrate is stockpiled and reclaimed as required to the foot of a bucket elevator by a Sauerman DragScraper Machine at a Southern chemical plant.

A self-propelled tail tower travels around the perimeter of the stockpile. The tower is shifted to change the line of operation. DragScraper haul length is 400 ft. The operator's station for the Sauerman hoist is located above the conveyors to give a clear view of the pile.

(Condensed from Sauerman News No. 151)

MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 632 S. 28th Ave., Bellwood, Ill.

Sept. 1, 1961. It is budgeted at $1 million, including air conditioning.

Cutting out glass isn't confined to the southwest, either. Paul A. Miller, superintendent of schools for Syracuse, N. Y., reports that Syracuse will open a junior high school for 800 students in September 1961, that has very little window area and is completely air conditioned. Of over 150 superintendents questioned during a cross country tour, Mr. Miller said, a fifth want to eliminate windows, nearly half want to retain them. The remainder are undecided. Mr. Miller thinks the undecided ones and many of the others will swing over to the windowless idea.

What about claustrophobia? Mr. Miller says if you can shop or manufacture in a windowless building, you can teach and learn in one too.

How do the students feel? Mrs. Eva G. McDonald, an Alton, Ill., teacher, made a survey of schools, teachers and administrators. Teachers in a windowless school in Hobbs, N. M., reported students did better work in the building and complained of "poorer conditions" when shifted to an older building.

Walter T. Rolfe of Goleman & Rolfe looks forward to more windowless schools as a means of saving in mechanical and electrical costs as well as in lowered perimeter construction cost. He emphasized shorter plumbing runs, higher voltages and frequencies in wiring with reductions in wire sizes.

Cost reductions are figured for the windowless schools even with combined air conditioning and heating.

Windowless Pumping Plant Built Safe from A-Bombs

Protection from A-bomb blasts is being built into three new water-pumping stations in Milwaukee. Water pumped through the stations will serve suburban Milwaukee and will be used to fight fires and wash away contaminated materials.

Built of reinforced concrete, the windowless structures will have walls and roofs 2 ft thick. Ordinarily walls would be about 8 in. thick.

Two of the stations are now under construction. One, a raw water pumping station, will cost over $2 million and will house four pumps, each with a 35-mgd capacity. Provision is being made for four more pumps. The other station will pump purified water to the customer at the rate of 263 mgd. Initial cost is about $1.5 million.

The third plant, soon to be under contract, will cost almost $3 million. Initial capacity will be about 165 mgd.

One ingenious, pleasant and immensely practical way to get people to enjoy an island park is to *carry* them there through the air. Starved Rock Airpark Inc. did just this by erecting a passenger tramway that "flies" over the Illinois River. The owner reports the facility has met with considerable success—both from an aesthetic aspect as well as that of moving people from one point to another.

When it comes to moving anything from one point to another via a suspension system, it's time to say, "Roebling." Our experience with tramways of every description is unparalleled from design to erection. You may not have a state park that you'd like more people to enjoy—you may, though, have a passenger—or materials-handling situation that you'd like to get off the ground. In which case you have only to write to Roebling's Bridge Division, Trenton 2, New Jersey for the "moving" details.

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Visitors "Fed" to Illinois' Starved Rock Airpark

Via ROEBLING-DESIGNED PASSENGER TRAMWAY

Starved Rock Airpark Passenger Tramway, Starved Rock State Park, Illinois. Consulting Engineer: *Edward P. Haugen, LaSalle, Ill.* Cables & Tramway: *John A. Roebling's Sons Division, Trenton, New Jersey*

Left to right: J. R. Riggs, General Superintendent, with Joe Metz, Gulf Sales Engineer, and E. E. Snyder, Project Manager. On-the-job engineering service is one of the plus values you get when you deal with Gulf.

On the Niagara Power Project . . . 2 million cubic yards of

GULF MAKES THINGS

The Niagara Power Project is the largest hydro-electric development in the Western World. Once completed, it will generate 2,190,000 kilowatts of electricity. Some 39 million cubic yards of rock will be excavated to prepare intake channels and foundations for two dams.

A vital part of this tremendous project is the 40-million dollar Tuscarora Pumping-Generating Plant. It's being constructed by the joint Tuscarora Contractors: Arundel Corp., L. E. Dixon Co., and the Hunkin-Conkey Co. Project Manager: E. E. Snyder. And behind him, 1,300 rugged crewmen and over two million dollars in construction equipment. Digging began on December 1, 1958. In one six-month period, this crew moved 1,300,000 cubic yards of rock—more than 1,000 cubic yards an hour.

Working with Tuscarora Contractors, Gulf engineers set up a preventive maintenance program that required only seven lubricants for all equipment. These multi-purpose lubricants keep the program simple and effective—all have built-in safety factors. And the program is economical. There are less products to buy. Ship. Store.

A really big project. Plans call for the removal of 39 million cubic yards of rock. It's the greatest amount to be moved since the construction of the Panama Canal.

Long haul. Blunt-nosed diesels have moved 2 million cubic yards of rock—without losing a transmission. The reason: Gulf Dieselube H.D.

Rip, tear and tug. Gulf lubes and greases help heavy duty construction equipment set the pace. No equipment has failed because of faulty lubrication.

Fill 'er up. On this project, diesels have guzzled over a million gallons of Gulf diesel fuel. Other vehicles have used a quarter-million gallons of Good Gulf Gasoline.

rock moved, and not one transmission failure . . .

RUN BETTER!

Del Lundmark, Equipment Superintendent, says, "We're the only contractor on this project who hasn't lost at least one transmission—and we've moved 2 million cubic yards of rock. I feel that the hydraulic fluid we use—Gulf® Dieselube H.D.—deserves much of the credit." Lastly, Del says, "None of our equipment has failed from faulty lubrication. And we've used over a million gallons of Gulf® diesel fuel, and a quarter-million gallons each of Good Gulf® Gasoline, Gulf Super-Duty® motor oil and other Gulf® lubes."

On your next project, see how Gulf makes things run better! You can do the job faster and reduce maintenance costs with Gulf products and service. Call your nearest Gulf office.

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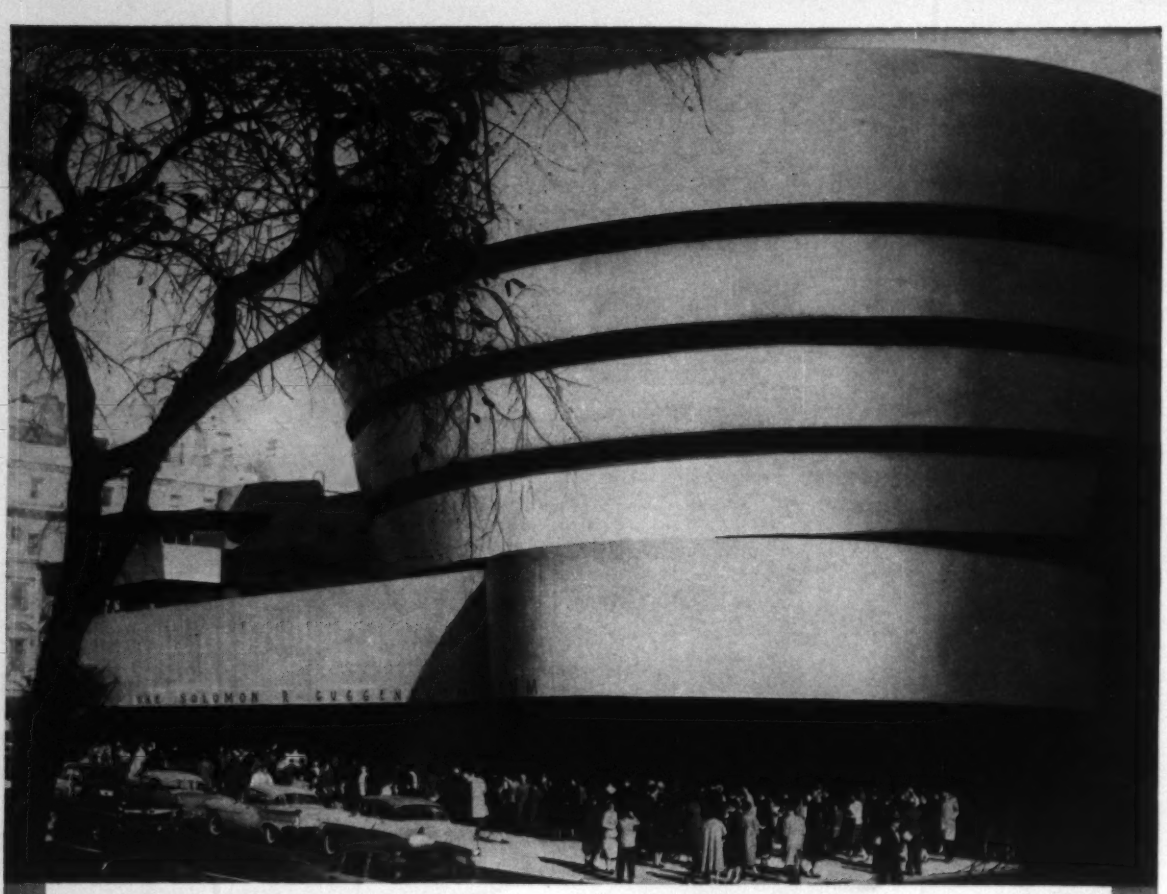

The Solomon R. Guggenheim Museum, New York, New York
Architect: Frank Lloyd Wright
General Contractor: Euclid Contracting Corp., New York, New York

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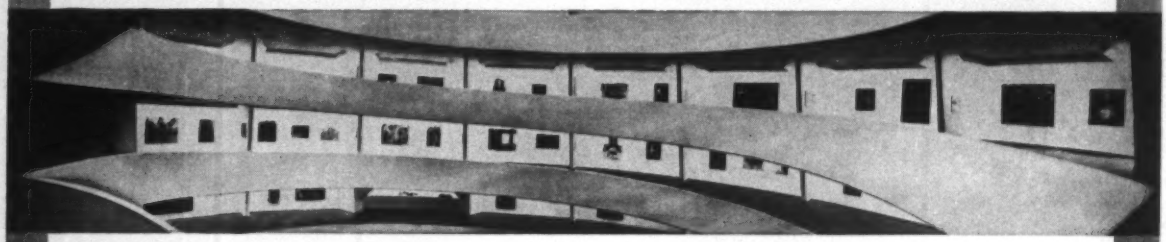
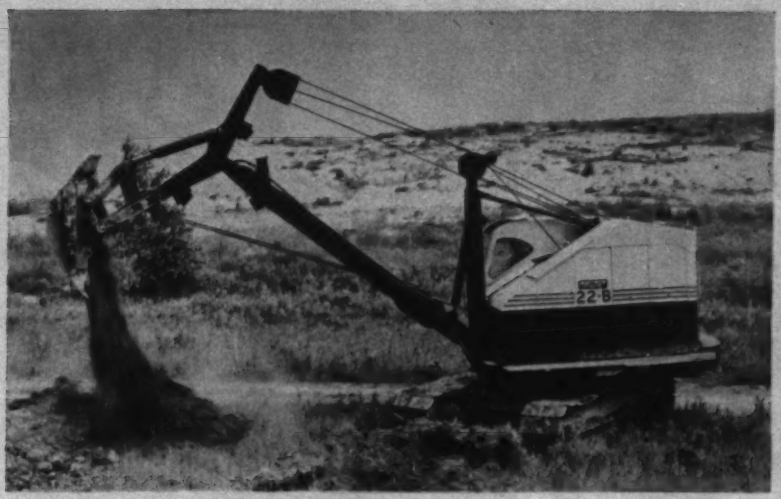


Interior view of the museum showing spiral ramp galleries.

As a pioneer in contemporary building design, Frank Lloyd Wright used reinforced concrete freely in the achievement of his most outstanding building designs. His famous Guggenheim Museum in New York City is a monument to his creative genius and an excellent example of the design freedom possible with this flexible construction material.

Concrete Reinforcing Steel Institute
38 South Dearborn Street
Chicago 3, Illinois

16-6



Trenching Attachment . . .

. . . Shines in Tight Spots

A hydraulic 2-in-1 hoe attachment has been designed for converting Bucyrus-Erie crawler machines for hoe or front-end loader work.

The machine adaptor is particularly advantageous for high-production trenching work in cramped, congested quarters or in areas where a smaller machine would put a limit on output.

The trench-cutting dipper is equipped with cutting teeth on both the front and the rear edges; it can work either as a hoe or as a regular power shovel. In addition to the two cutting edges, the 84 in.-wide dipper is built with side cutters to speed the trench work operations.

In addition to capacity-boosting advantages, the combination of boom hold-down pressure and the wrist-action dipper eases leveling and cleanout. Hand labor is thereby relieved for other work.

As a front end loader, the 15-ft boom is equipped with a hydraulic "hoe-down" device to act as a hydraulic brake. Push button controls operate the wrist action linkage of the 1½-cu yd bucket. Bucyrus-Erie Co., South Milwaukee, Wis.

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In Canada — Terry Machinery Co., Ltd.

Gage Tells Pile Hammer Energy

A simple gage measures the energy output of the Link-Belt diesel pile hammer. The manufacturers say the gage is simple to use and its results are accurate under any driving conditions.

The instrument is designed to overcome what had been considered the Link-Belt diesel pile hammer's greatest weakness—the difficulty in determining energy output (ENR May 15, 1958, p. 54).

The two other makes of diesel hammers most commonly used in the United States have open cylinders and pistons whose fall can be measured visually. The Link-Belt piston works within a closed cylinder and therefore cannot be seen during operation. In contrast to the other two makes of hammers, which derive their energy principally from a free-falling ram, the Link-Belt ram is given added impetus by air compressed in the bounce chamber by the upward movement of the ram during operation. The extent of this compression has heretofore been unmeasurable except under ideal conditions, when a slight raising of the cylinder indicated maximum hammer efficiency.

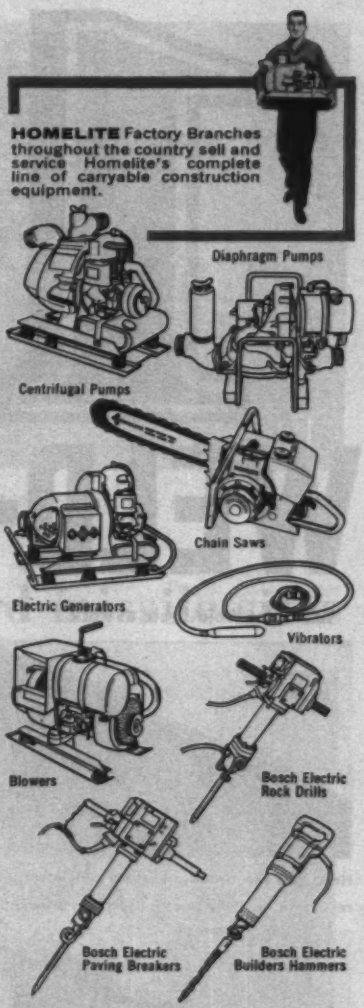
The gage is connected to the bounce chamber by means of a hose, and records on its dial the stroke of the ram and the pressure within the bounce chamber. Conversion tables provided with the gage make it possible to convert dial readings into values of hammer energy. LINK BELT SPEEDER CORP, 1201 SIXTH ST., S.W., CEDAR RAPIDS, IOWA

Portable Belt Conveyor Made for Placing Concrete

A hydraulic drive portable belt conveyor with idler rolls that need no adjusting has been designed to handle concrete placing, as well as doing other jobs that can be handled by belt conveying. The maker states that the self-training idler roller conveyor will handle concrete faster than a crane with a ¾-yd bucket.

The idler assembly automatically compensates for the tendency of the load to drift downhill if the undercarriage is not level. The belt is troughed by a patented two-row idler assembly with each row supported at both ends. The complete assembly pivots on a special shaft carried in a bearing built into the boom section.

Hydraulic drive permits positive control of infinitely variable speeds up to 220 ft per min. Conveyor units are available in fully portable models with 32-, 40- and 48-ft conveyors. A semi-portable model is available with a 56-ft conveyor. MORGEN MFG. CO., YANKTON, S. D.



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SOUTH: GEORGIA: Atlanta • FLORIDA: Jacksonville, Miami • LOUISIANA: New Orleans (Metairie), Shreveport (Bossier City) • NORTH CAROLINA: Charlotte, Raleigh • OKLAHOMA: Oklahoma City • TENNESSEE: Knoxville, Memphis • TEXAS: Dallas, Lufkin

MID-WEST: ILLINOIS: Chicago (Stone Park) • INDIANA: Indianapolis • MICHIGAN: Detroit, Grand Rapids • MINNESOTA: St. Paul • MISSOURI: Kansas City, St. Louis • NEBRASKA: Omaha • OHIO: Cincinnati, Cleveland, Toledo • WISCONSIN: Milwaukee

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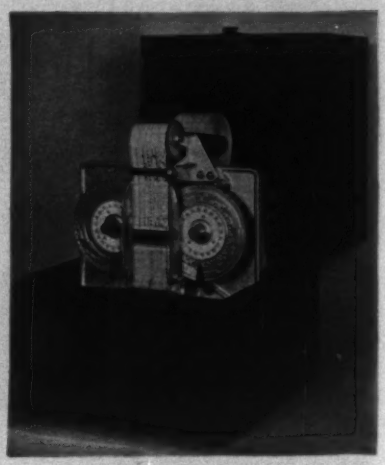

Traffic Counter Uses Tape To Save on Data Handling

A traffic counter produces a punched tape that can be translated into a punched card, punched computer tape, or typewritten form without manual data handling.

The counter can be activated by any type of detecting element, can record 30 counts per second and can be set to punch totals every 15, 30 or 60 minutes.

According to the manufacturer, a month's readings punched at 15-minute intervals can be put on punched cards in about 15 minutes.

The counter is manufactured in both portable and permanent models. The portable model is powered by a 6-volt dry-cell battery weighing only 40 lb. A single battery used at a 15 minute read-out intervals will last one year.

The permanent unit includes a rectifier and will operate on standard 110-120 volt power. Both the permanent and portable models can be loaded with enough tape for one year of service. Fischer & Porter Co., 552 Jacksonville Rd., Warminster, Pa.

Air-Cooled Diesels Power Portable Pumps

A line of air-cooled diesel engines, named Yanmar, is available in the 2 to 4½-bhp range. They are designed for powering portable equipment, emergency pumps and generators.

The four-cycle, single-cylinder engines operate in the 2,000 to 3,000 rpm range. They may be obtained with crank shaft or half-speed cam shaft drives.

Similar small diesels are also available in water-cooled models to 8 bhp at 2,000 rpm. The engines are made in Japan according to U. S. standards. Continental Machinery Corp., P. O. Box 5309, Long Beach 5, Calif.

JUNCTION YOKE—Preassembled before shipment to assure speedy erection and sure fit of components at job site.

TUNNEL JUNCTION—Liner plates frame into self-supporting, clear opening junction yoke.

How steel liners "shock proof" hard missile sites

3000 feet of shock proof tunnels—COMMERCIAL tunnel liners reinforce the pedestrian access tunnels of the Vandenberg Hard Missile Complex. Chosen because of their ability to withstand and divert the ground shock wave of possible thermonuclear explosion, COMMERCIAL liners with their neat, clean cut, massive appearance had merely to be painted white to function as finished tunnel walls. Liner assembly crews, working directly behind the boring machine, erected up to 17 complete liner rings per 8-hour shift aided appreciably by pre-matched bolt holes in the internal flanges of the plates. Liner plates—$\frac{3}{16}$" to $\frac{1}{4}$" thick, 16" wide x 37$\frac{11}{16}$" long, curved to a 63" radius—were supplied by COMMERCIAL on schedule to tie-in with the "crash program" timetable of the project.

Custom design yokes—At junctions of pedestrian tunnels additional support and a unique way of framing-in the liner plate was afforded by specially designed 3-legged yokes. Engineered-to-the-job by COMMERCIAL, these 16" WF beams, self-supporting assemblies, allowed easy junction closure—a continuous liner plate and ring tunnel.

"Crash program" scheduling—Under highest national priority, the construction timetable of the Vandenberg Project—our first training and operational missile base—made it imperative that all suppliers be experienced, reliable and *fast to deliver*. Because of its depth of experience and technical service, its complete manufacturing facilities, COMMERCIAL easily beat the countdown. For complete information on how COMMERCIAL has aided others in the construction of their vertical shaft, surface or sub-surface tunnel projects, ask for Bulletin 300-P14.

COMPLETED PEDESTRIAN TUNNEL—Liner plates painted white serve as finished wall. Note staggered joints and *inside* bolting of flanges.

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2½ and 5 pound pressurized units! Granted top rating by U.L., these two units pack the extra punch needed to get the jump on fire. For example, the 2½ pound Kidde unit is as compact as a 1 quart carbon tet model, yet is eight times as powerful! Both the 2½ and 5 feature simple, two-step operation, easy-to-read dust-and-moisture-proof gauges. 10 pound dry chemical also available.

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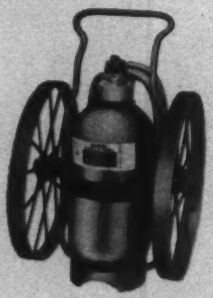

200 pound dry chemical wheeled unit! Kidde's 200 pounder discharges a 40-foot stream faster, has an *extra* 50 pounds of fire-smothering dry chemical to knock down fire quicker. Low center of gravity and wide wheels make it easy to maneuver. Easy-to-use discharge control makes operation simple.

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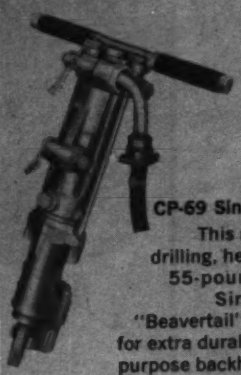
sinkers



CP-69 Sinker Drill. This new, fast drilling, heavy-duty 55-pound class Sinker has "Beavertail" retainer for extra durability. All-purpose backhead permits Blower Dry, Wet and Air-Water operation. Air consumption and maintenance are low.

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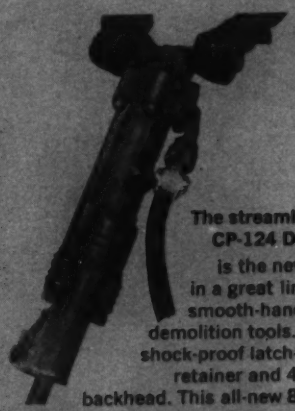
demos



The streamlined CP-124 Demo is the newest in a great line of smooth-handling demolition tools. Has shock-proof latch-type retainer and 4-bolt backhead. This all-new 80-lb. class demo packs more smashing power per pound than any other demo on the market.

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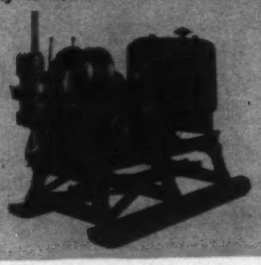
CP post-mounted Core Drills cut costs for: blastholing, foundation sampling, grout-holing, weep holes. The new CP-65 Diamond Drill — world's fastest — delivers 20% more power than its predecessor, the world-famous CP-55. Capacity: 600 feet with EX Fittings.

Versatile skid-mounted Core Drills may also be truck mounted. Gasoline, diesel, air or electric drive. Capacity to 2,250 feet with EX Fittings.



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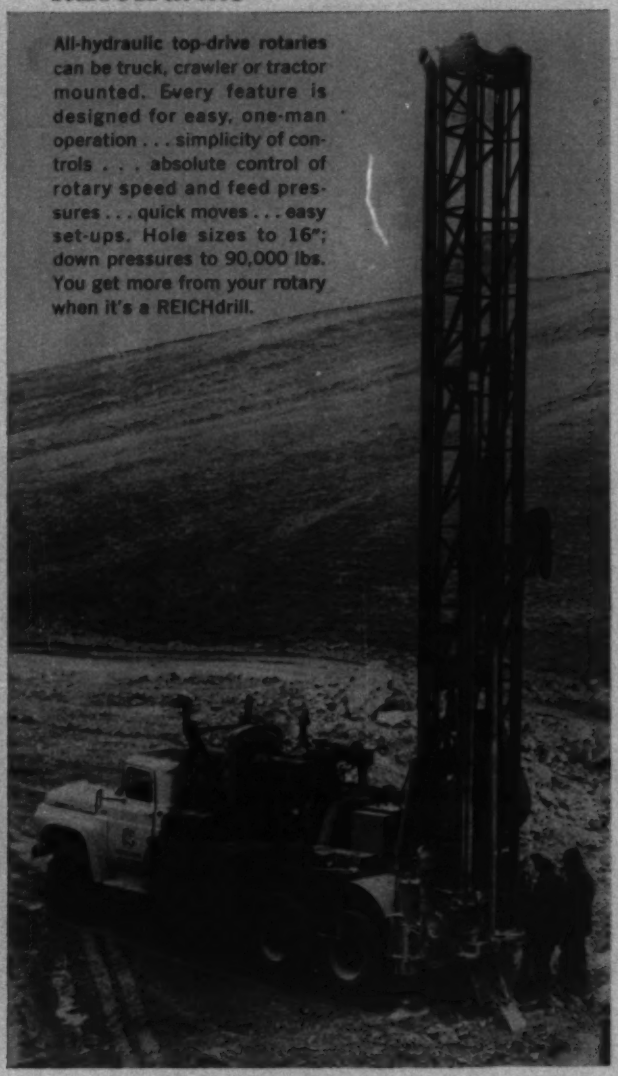

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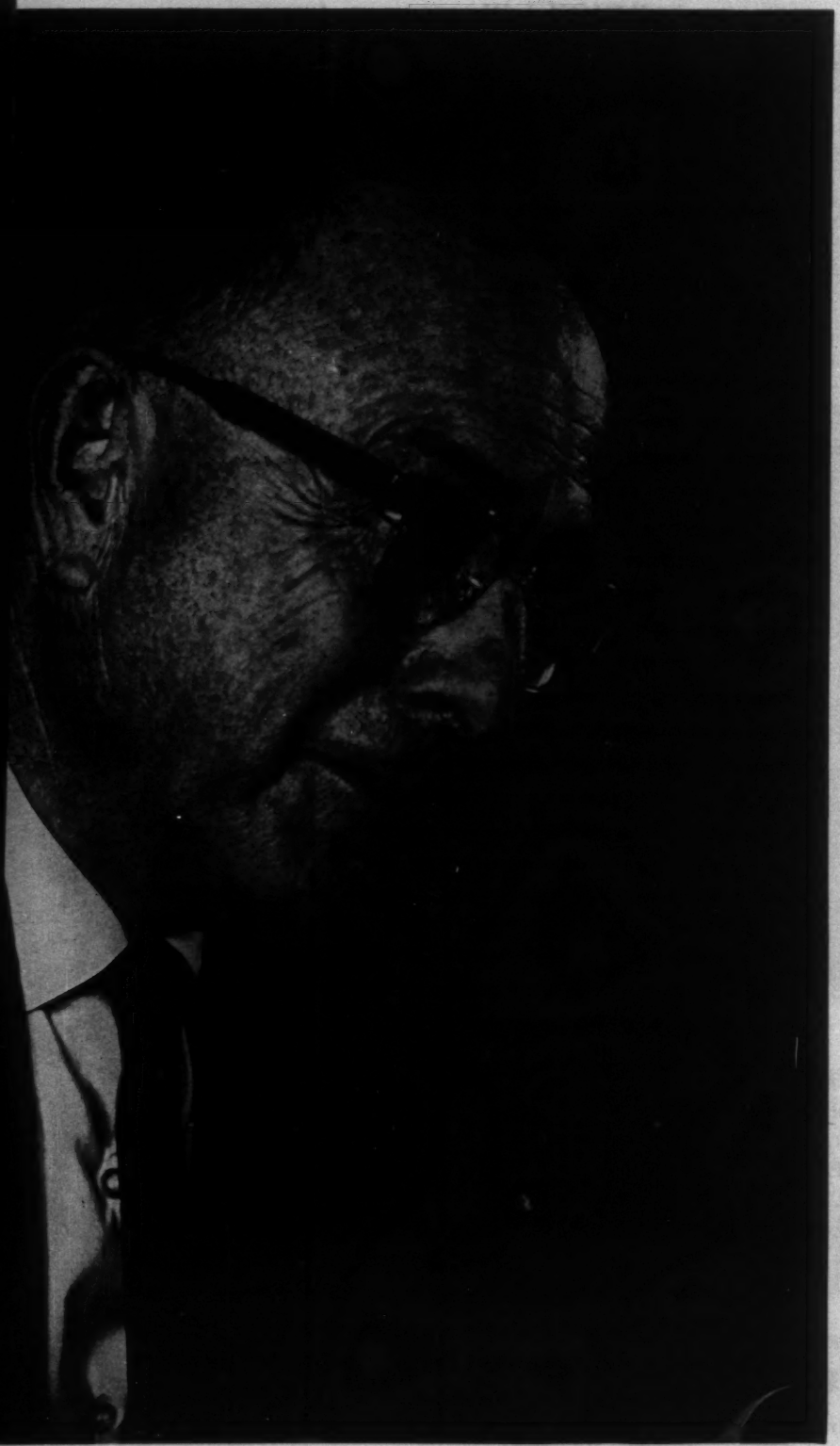

Glen Holcomb: If you were a graduate, which job would you take?

To Attract

Professor Glenn W. Holcomb paused, pulled off his glasses, leaned forward in his chair and asked:

"If you were a civil engineer graduate and received offers of $575 a month with an aircraft manufacturer and $460 with a highway department, which would you take?"

The new president of the American Society of Civil Engineers, and head of the civil engineering department at Oregon State College, didn't wait for an answer to his question.

His contention: It's not lack of glamor or educational challenge that causes bright young men to bypass civil engineering for the more exotic engineering fields like electronics and rocketry.

The reason the profession is not getting or keeping the quantity and the quality of civils it needs, he believes, is primarily that salaries are not high enough.

Students are "thinking about what's in the future," the amiable 64-year-old professor explained. "They are concerned about whether they'll be able to buy an outboard motorboat, an automobile and all those other things. It's economics."

What about glamor? Sure, civil engineering still has some, like magnificent The Dalles Dam, a construction masterpiece portrayed on the wall of Professor Holcomb's Apperson Hall office. Or the fascinating hyperbolic paraboloid roof structure, a model of which sits near his desk.

But these apparently aren't the things that attract many young men nowadays. "I think youngsters get interested in different things and get to like them," Glenn Holcomb observed. "Then they see where the money is . . . The word gets around . . . And the word seems to be out that civils do not get as high salaries."

Result: Civil engineering is the loser.

He cited the example of one of his more promising students, who, rather than go into civil engineering practice or start graduate work, accepted a high-paying job with an airplane manufacturer. He studied mathematics at night for three years and is now working on the design of missile nose cone rings.

For every civil engineering graduate who enters another field, there are many other young men, increasing numbers of them, who choose another

CEs, Money Talks: Holcomb

course of study from the start, he says. At Oregon State College, the number of CE graduates fell from 84 last year to 75 this school year.

What is the answer? Is it increased salaries to attract more top quality students into the field and raise the standard of the profession? Or is it intensified effort to raise the standard of the profession so that civils will command greater salaries?

Glenn Holcomb believes the two should "go hand in hand."

"If you raise the ability of the

"Pay and ability go together."

individual, he'll probably receive a higher salary. On the other hand, if salaries are higher, you'll have better men going into the profession.

"If we get salaries up equal to the rocket and airplane industries, over a couple of years you'll find that if the kids will take one thing they'll take something else, because money talks."

How can salaries for civils be boosted? Competition eventually may force them up, the professor answered. It's happening already in the teaching field, he says.

As for raising the standards of the profession, he continued, "I think we are doing just that." He pointed to efforts to improve curriculum, starting with the Grinter report of 1955, recommendations of which have since become the basis for accreditation by the Engineering Council for Professional Development.

Professor Holcomb disagrees strongly with the view that the answer to civil engineering's problems lies in sweeping changes in the college degree-granting program for civils.

"I think we've got to make changes," he conceded, "but I don't think we should go for drastic changes."

And by "drastic changes" he meant primarily the five-year program proposed at the July conference of civil engineering educators and practitioners in Ann Arbor, Mich. (ENR July 14, p. 32). Under the plan set forth there a student would not be granted a professional degree until completion of a fifth year.

Professor Holcomb is generally against that proposal.

"There is a large amount of professional civil engineering practice that can be done satisfactorily under present standards with a four-year course," he said. "We have a great need for large numbers of men capable of being resident engineers, designers and construction superintendents, who don't need solid state physics and higher mathematics."

He agreed that many jobs in the civil profession now require more brainpower. To fill that need, he said, the institutions should at the end of the sophomore year "start looking for the gifted students . . . those who are qualified to do graduate work. They should be encouraged to take advanced courses in science and mathematics beyond what they commonly get in their freshman and sophomore years."

But the OSC professor is wary of the trend toward the scientific over the practical in civil engineering teaching.

In short, the professor said, a curriculum should not be so heavily seasoned with advanced courses that it becomes necessary to "flunk out" many of the students. They should be saved for the lower-ranked fields in civil engineering.

In considering curriculum changes, Professor Holcomb advised against being "stampeded into standardization" throughout the country. If you let the faculties develop as they think they should under the umbrella of accreditation, he said, "you'll find one school will hit on something exceedingly good and the others will be glad to follow. If you are too standardized, you kill initiative."

What does President Holcomb hope to accomplish at the helm of the American Society of Civil Engineers?

On public relations: "The Society should emphasize and work on public relations with the idea of getting people better informed of what the civil engineer does and what the opportunities are. . . ."

"It's time we got our local engineer stirred up to the need to make his work known . . . to particpate more in community affairs and to work more with young people or parents . . . They (the civils) have got to donate more of their time to affairs for which they may not receive immediate remuneration."

The role of the Society, he said, must be to make the engineer realize the need for an active role in his community.

Glenn Holcomb has set a good example in the way of involvement. He was a member of the Corvallis water commission for six years, has been on the city council off and on for six years since 1948. He is also a Rotarian and a member of the Elks.

All of his city positions have been by appointment, although this year he is running for a seat on the council, without opposition.

Participation in community affairs is a two-way street for the engineer, the professor said. He can contribute his technical knowledge, which is in great demand in city government, and at the same time can learn a great deal about human relations, politics, finances and taxes.

"If an engineer is designing a sewer

"Lower-rank men also needed."

line or water filtration plant for a city," Holcomb declared, "he ought to know something about the tax structure and bonding capacity as well as the pipeline he's going to put in."

Another phase of the Holcomb involvement is his membership since 1948

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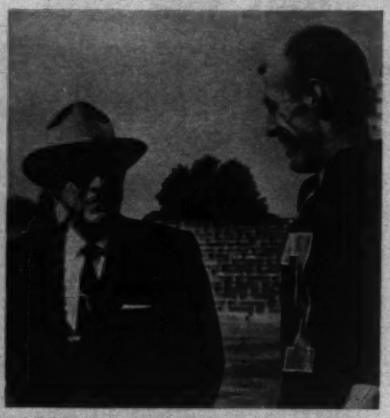

PROFESSOR HOLCOMB believes in involvement in a wide range of interests.

on OSC's Intercollegiate Athletic Board, of which he is now chairman. He was also faculty representative on the Pacific Coast Conference until it broke up two years ago.

The professor admitted an intense interest in sports. He was never an active participant in athletics, mainly because he had to walk up to 12 miles a day during high school and was busy working his way through college. (Fishing is his favorite hobby, and a photograph of a long string of salmon is proof of his prowess with rod and reel.)

On research: "Civils are working on it . . . although not to the extent of the others because we don't have the war scare in our field.

"The civil field needs to step up its activity in the field of automation . . . More research and study should be given to computation methods by automatic computors." He proposed summer schools where college instructors in civil engineering could learn computor methods and then start courses in their own institutions.

In emphasizing research, Professor Holcomb said, the colleges should not forget their primary job is teaching. "Research is a good thing, but I still think the major objective in college is teaching, and there ought to be more credit given to the teacher."

The new president of the ASCE is first and last a teacher, one who takes a deep interest in his students, while they are in school and long afterward. He keeps an up to date file of their addresses and exchanges correspondence with them as long as they wish to write. For some, that is indefinitely. "A graduate of 1923 came in to see me the other day," the professor commented. He started his teaching career at OSC in 1920.

To the students, "his door is always open," a colleague said. Glenn Holcomb is never too busy to talk.

An easy going sort, the long-time professor has never deigned to "take himself too seriously," according to another colleague. His sense of humor is well known.

Glenn Willis Holcomb was born in Charlotte, Mich.; he earned a bachelor of science degree in civil engineering at the University of Michigan and a master of science at Oregon State. He worked in railroad appraising and surveying for a total of four years before joining the Oregon State faculty. He has been with it ever since.

A registered professional engineer, he was consulting structural engineer at Camp Adair in Oregon in 1942 and was institutional representative from 1942 to 1945 for Engineering Science Management War Training. He is past president of the Oregon section, ASCE; member of the board of direction, 1953; national director, 1955-57, then vice president and now president.

Professor Holcomb belives that what some observers fear is a crisis in civil engineering is realy more of a cycle, now in a downward trend, that eventually will reverse itself.

"When I was in school, the highway program was booming," he said. "Two years later it was all radio, and they all went electrical.

"I would predict that the civil field will go along with the rest of them," he concluded. "There is always something new coming along."

Briefs . . .

Business

H. S. Smith has withdrawn as a partner of Stanley Engineering Co., Muscatine, Iowa, to do graduate work in preparation for a teaching career. **Maxwell Stanley, Arthur Stanley** and **Sanford Fosholt** remain as partners with **Roy F. Vanek** and **Frank W. Edwards** as associates.

William E. Jeffrey has been elected vice president of Hunkin-Conkey Construction Co., Cleveland, Ohio. In addition to his new duties, he will continue in his present post of general manager of Hunkin-Conkey's buildings and industrial construction division.

Williams Construction Co., Baltimore, Md., has named **Norman Pritchett** vice president. Mr. Prichett was for 32 years a member of Maryland's State Roads Commission and from 1953 to 1960 was chief engineer. He is also chairman of the American Association of State Highway Officials' right-of-way committee.

Clarence A. Butler has been named to the partnership of R. B. McMullin Associates, Niagara Falls, N. Y., consulting engineers.

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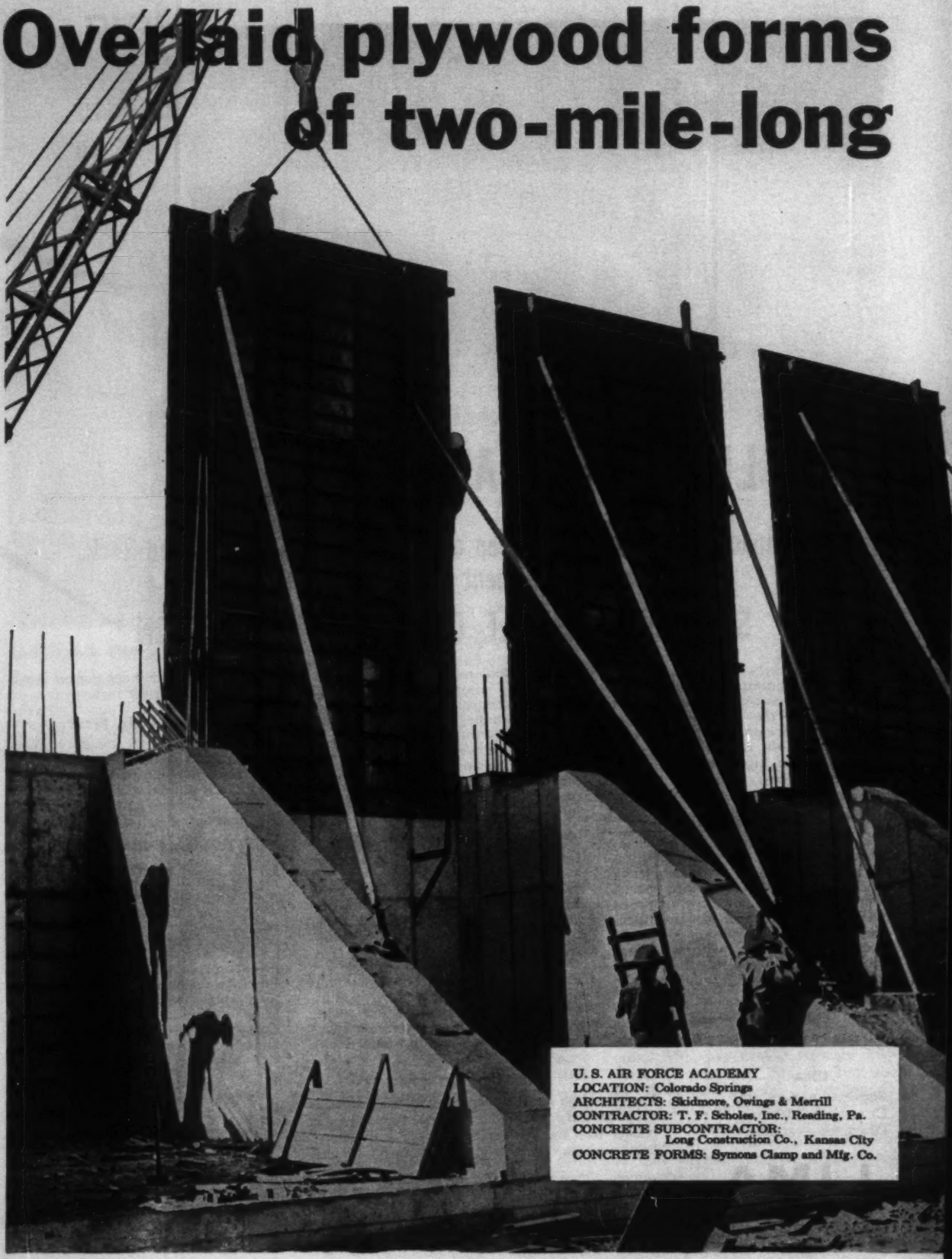
Overlaid plywood forms of two-mile-long



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OVERLAID PLYWOOD CONCRETE FORMS did a big job in a hurry at the Air Force Academy in Colorado Springs. The 10,000 ft. retaining wall that bounds two sides of the raised campus was formed at the rate of 70 lin. ft. daily. Large plywood panel assemblies cut time and cost because of their high rate of re-use. And the overlaid plywood formed such smooth concrete that it was possible to install granite surfacing over it with a minimum clearance and maximum simplicity of anchorage.

Wall height varies from 15½ to 33 ft. Along most of its length, counterforts on 14-ft. centers connect it with an anchor wall 18 ft. to the rear. Each 70-ft.-long section was concreted in three pours: first, footings; second, anchor wall and the lower 13 ft. of both counterforts and main wall; third, upper portions.

Form components were Symons Steel-Ply forms—2x8-ft. panels of high density overlaid fir plywood, encased in steel frames 2½ in. thick. They were pre-assembled into large units, two panels high and six wide, and placed by crane or from traveling scaffolds. Overlaid plywood was specified to produce ultra-smooth concrete and for its high re-usability. The contractor formed 600,000 sq. ft. of wall with 37,000 sq. ft. of plywood and has used the same forms many times since.

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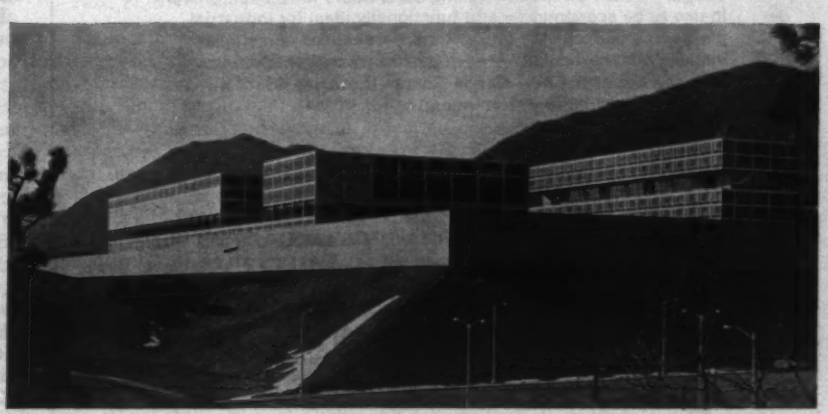

In design and material, the granite-surfaced concrete wall is architecturally harmonious with the raised geometric campus it encompasses. Overlaid plywood forms insured smooth concrete and reduced costs.

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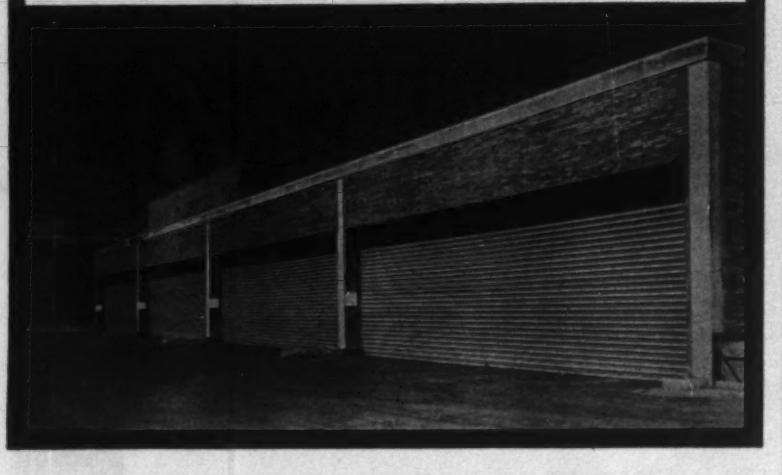

Newest addition to the family of Rolling Doors from Mahon is a curtain design that fills a real need in many door applications. It uses 7-inch-wide interlocking slats of heavy (16- or 14-gage) Bonderized steel to provide *extra-long life in hard and constant usage.* These new Mahon Rolling Steel Doors have been proven-in-use to be economically and functionally ideal for industrial plants, railroad, truck and maritime warehouses and similar installations, particularly involving extra-wide door openings. Shown: Four of the new Mahon Doors—these are 48' 5" x 15' 6" sizes. Write for information.

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MAHON

. . . Men and Jobs

Joseph W. Lipscomb has been appointed manager of Florida operations for Gannett Fleming Corddry & Carpenter, Inc., consulting engineering firm with headquarters in Harrisburg, Pa. He succeeds **Quentin L. Hampton** to the post.

Roy O. Smith has resigned as Chief of the Construction Division, U. S. Army Engineer District, Seattle, to work on the Minuteman missile program of Boeing Airplane Co.

John R. Campbell has been appointed director of design for the New York office of Welton Becket and Associates. Mr. Campbell was formerly a partner of Harris, Rice & Campbell architects, Los Angeles. He will work on the international architectural firm's operations on the East Coast and overseas.

E. Warren Bowden has been elected president of Walter Kidde Engineers Southwest, Inc., Houston, Tex., a subsidiary of Walter Kidde Constructors, Inc., New York and Houston.

Saxon B. Palmeter, former construction superintendent for Burns and Roe, Inc., engineers and constructors of New York City, has been named to the newly created position of superintendent of construction for Jersey Central Power & Light Co. and New Jersey Power & Light Co.

Continental Pipe Line Co. Houston, Tex., has promoted **S. W. Ogan** of Ponca City Okla., from superintendent of operations to manager of construction.

John B. Allen, formerly with James I. Barnes Construction Co. of Los Angeles, has established his own organization, John B. Allen & Co., to do general contracting in Santa Barbara, Calif.

Leo M. Buhr, chief of the construction operations division of the North Pacific Division, U. S. Army Engineers, has resigned after 32 years of government service to accept a position with the Titan Installation and Activation Division of American Machine and Foundry Co., Portland, Ore. He will be assistant field manager at the Beale Air Force Base project.

Skidmore Owings & Merrill, architects, with offices in New York, Chicago, San Francisco and Portland, have announced the election of **Roy O. Allen, Jr., Edward C. Bassett** and **Bruce J. Graham** as general partners to the firm.

Robert T. Dormer, former deputy director of Urban Renewal Administration, Region I, has been named director of the Urban Renewal Division of Victor Gruen Associates, architects, engineers and planners with offices in New York, Chicago and Los Angeles.

Masters of Architecture

PIER LUIGI NERVI—by Ada Louise Huxtable. LUDWIG MIES VAN DER ROHE—by Arthur Drexler. LE CORBUSIER—by Francoise Choay. FRANK LLOYD WRIGHT—by Vincent Scully Jr. ALVAR AALTO—by Frederick Gutheim. ANTONIO GAUDI—by George R. Collins. 128 pp. each. George Braziller, Inc., New York, N. Y. $3.95 each.

Studies of six modern architects are skillfully assembled in a series called "Masters of World Architecture." The structures discussed range from Le Corbusier's High Court Building in Chandigarh, India, to Mies van der Rohe's Seagram Building in New York City. The series, with topics ranging from esthetics to details of structural construction, is informative to the engineer and layman alike.

The text on Nervi will perhaps be the most interesting for engineers, because he views contemporary architecture as a structural art that grows immediately out of engineering.

He is pictured as the product of an age of technology, with his extensive use of reinforced, precast concrete for structures, such as warehouses, stadiums and factories.

Ludwig Mies van der Rohe also is discussed in terms of modern industrial life. His emphasis on structural uniformity is exemplified in his glass-walled, steel-caged Chicago apartment houses.

In contrast to Nervi and Mies, Le Corbusier is shown as a humanist, idealizing man in the construction of his private homes and in his town planning. He is described as using concrete in an esthetic way, stressing the play of light, for example, in comparison with Nervi who uses it for complex tensions.

The book on Frank Lloyd Wright gives a rough chronological comparison of some of his buildings.

It shows how he developed and executed his theories, starting out with the neo-Gothic influence in 1876 to the development of curves in achitecture, which is climaxed in the Guggenheim Museum.

The structures of Alvar Aalto reflect his native Finland, where brick is the predominant construction material because of the lack of steel. His works include buildings not only in Finland, but also in Berlin, Boston and Bagdad. But even in countries where he is free from the limitations of Finnish economy, he still uses basic Finnish characteristics and expressions.

Antonio Gaudi, Barcelona's noted architect, holds great interest for engineers with his hyperbolic-paraboloid surfaces. He also has employed undulating vault surfaces, which now are used in thin-shell concrete structures.

Building Glossary

BUILDING AND CONSTRUCTION TERMS—By Benjamin Lipowsky and Murray Bersten. 57 pages. Arco Publishing Co., 480 Lexington Ave., New York 17, N. Y. $5. (Paper cover, $3.)

About 500 terms commonly used in building construction are defined in this book. The definitions also are supplemented by 21 drawings of parts of buildings showing components corresponding to the terms defined.

The glossary is far from complete. But enough basic terms are included to make it useful to beginners.

The definitions, the authors say, are based on New York City laws and usage, and thus are in universal use. This contention can easily be challenged in view of the diversity of building codes throughout the country. The authors would have been better advised to adopt the definitions developed by the Joint Committee on Unification of Building Codes, or at least those in one of the national model building codes.

Measurement by Photos

PHOTOGRAMMETRY AND PHOTO-INTERPRETATION—By Stephen H. Spurr. 472 pages. The Ronald Press Co., New York, N. Y. $12.00.

Photogrammetry is defined as the science or art of obtaining reliable measurement by means of photography.

This book emphasizes the measurement of images and vertical aerial photographs for both quantitative photo-interpretation and mapmaking. A limited discussion is included of the measurement of images on oblique aerial photographs because of the use of such photographs in quantitative photo-interpretation. The principles discussed, however, apply to all phases of photogrammetry.

Although under a new title, the book is the second edition of *Aerial Photographs in Forestry*. It is expanded to serve those who use aerial photography as a professional tool. Specialized material on applications to forestry include the use of aerial photographs in vegetation mapping, forest inventory and forest management.

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REINFORCED CONCRETE CHIMNEYS—by C. Percy Taylor and Leslie Turner. 81 pages. Concrete Publications Limited, 14 Dartmouth St., Lond, S.W. 1, Eng. $2.80.

REINFORCED CONCRETE COLUMN TABLES, ULTIMATE STRENGTH DESIGN — by Hugh F. Fenlon. F. W. Dodge Corp., 119 West 40th St., New York 18, N.Y. $15.00.

REACTOR HANDBOOK—second edition. Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N.Y. $36.50.

SYMPOSIUM ON DURABILITY AND WEATHERING OF STRUCTURAL SANDWICH CONSTRUCTION—STP 270. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $3.00.

ELEMENTARY THEORETICAL FLUID MECHANICS—by Karl Brenkert, Jr. 348 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y. $7.50.

MOTELS, HOTELS, RESTAURANTS AND BARS —second edition. 327 pages. F. W. Dodge Corp., 119 West 40th St., New York 18, N. Y. $9.75.

POSTWAR MARKET FOR STATE AND LOCAL GOVERNMENT SECURITIES—by Roland I. Robinson. 227 pages. Princeton University Press, Princeton, N. J. $5.00.

THE MUNICIPAL YEAR BOOK, 1960—590 pages. International City Managers' Association, 1313 East 60th St., Chicago 37, Ill. $10.00.

ON THE APPLICATION OF PLASTIC DESIGN —by Lynn S. Beedle. Report No. 205.70. Fritz Engineering Laboratory, Department of Civil Engineering, Lehigh University, Bethlehem, Pa.

THE STORY OF ENGINEERING—by James Kip Finch. 528 pages. Doubleday & Co., Inc., 575 Madison Ave., New York 22, N.Y. $1.45.

PHOTOGRAMMETRY AND PHOTO-INTERPRETATION—by Stephen H. Spurr. 472 pages. The Ronald Press Co., 15 East 26th St., New York 10, N. Y. $12.00.

WATER SUPPLY AND SEWERAGE—by Ernest W. Steel. Fourth edition. 655 pages. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y. $11.00.

AN EXPERIMENTAL INVESTIGATION OF STRESSES IN THE NEIGHBORHOOD OF ATTACHMENTS TO A CYLINDRICAL SHELL—by E. T. Cranch and INTERPRETIVE COMMENTARY ON THE APPLICATION OF THEORY TO EXPERIMENTAL RESULTS—by P. P. Bijlaard and E. T. Cranch. 44 pages. Welding Research Council, 29 West 39th St., New York 18, N. Y. $2.00.

For $32 per seat . . .

Stadium Is Enlarged, Improved

A low of $1,441,676 took the Jackson, Miss., Memorial Stadium contract for the Universal Bridge Co. of Jackson. Universal's bid trailed the engineer's estimate by 10%, but was only 5% under the second low entered by Robert C. Crouch of Memphis, Tenn.

Southeastern Construction Co., Jackson, high of six bidders, was off the mark by 26%. Michael J. Baker Jr., Jackson, is the engineer.

The design for enlarging to 45,000 seats and for adding such improvements as a new press box, rest rooms, concession stands, night lighting system, public address system, paved concourses and cinder track, provides for building the new stadium over the existing Hinds County Memorial stadium stands. The remodeling permits maximum use of the existing foundation; plumbing fixtures and fences will be re-used as well as other salvage materials. The new structure will be precast-prestressed double "tee" members supported by reinforced concrete frames.

The design of the stands contains a vertical or sight curve, created by varying riser heights with a constant tread width. The provision of the curve eliminated use of the existing seats and necessitates removing 12 ft of the stands. The new seats, of Alaska yellow cedar, are 9½ in. wide and 18 in. above floor deck. The median tread width of the rows will be 26 in.

The stadium must be ready for the 1961 football season and the contractor will be required to maintain the existing playing field in playing condition. The contract for paving of driveways, bus and auto parking areas, and construction of additional access walkways will be awarded during the progress of the stadium contract in accordance with available funds.

Prevailing base rates in Jackson: common labor, $1.50 per hr; carpenters, $3.00/hr; structural iron workers, $3.30, and reinforcing, $3.05; $2.85-$2.90 per hr for cement finishers; inside electrical workers, $3.40/hr; plumbers, $3.65; power shovel operators, $3.15; and air compressor operators, $2.30/hr.

The bidding included:

1B	Universal Bridge Co., Jackson, Miss.	$1,441,676
2	Robert C. Crouch, Memphis, Tenn.	1,532,438
4	Southeastern Constr. Co., Jackson, Miss.	1,950,661
EE	Michael Baker, Jr., Inc., Jackson, Miss.	1,656,303

Bids: 8-16-60 Items	Unit	Quantity	Unit Prices	
Demolition, clrng & disp	ls	job	$44,877	$33,880
Exc, common	cy	21,140	0.50	0.50
CMP, 8"	lf	120	2.25	3.00
12"	lf	360	3.50	4.00
24"	lf	30	6.80	9.00
PCP, 8"	lf	120	1.50	2.00
12"	lf	1,020	2.50	2.50
15"	lf	1,540	3.25	3.50
18"	lf	290	3.50	5.00
21"	lf	210	4.25	6.00
24"	lf	400	5.00	7.00
Pipe, headwall	ea	1	120.00	180.00
Outlet structure	ea	4	240.00	128.00
Inlet, type A	ea	1	200.00	250.00
type B	ea	8	150.00	200.00
type C	ea	18	100.00	160.00
curb	ea	4	160.00	160.00
Junction box	ea	14	90.00	110.00
Manhole, modify	ea	1	50.00	100.00
Field inlet, modify	ea	18	75.00	50.00
Gutter, drainage	lf	504	1.25	2.00
Filter material	cy	120	5.00	5.00
Topsoiling, fertilizing, seeding, mulching	ac	3.9	1,900	800.00
Sodding, solid	sy	5,340	0.90	0.90
Playing field, protect & maintain	ls	job	2,500	2,660
Paving type A	sy	3,370	1.60	1.50
type B	sy	909	2.60	2.50
Surfacing, type C	sy	5,040	0.60	0.50
Conc, curb & gutter	lf	1,600	1.80	1.95
structural	cy	6,325	55.20	66.00
Steel, reinforcing	lb	1,115,000	0.12	0.13
Conc piles, 14"ϕ	lf	19,880	2.20	2.00
18"ϕ	lf	1,820	3.35	3.30
30"ϕ	lf	80	6.90	7.00
Piling, bell bot 30"	ea	64	8.00	8.00
Deck, double tee, precast prestressed	ls	job	213,000	254,000
Conc, slab wkwys & concourse	cy	7,960	5.50	4.50
Steel bleachers, relocate	ls	job	18,000	28,000
Conc, block wall 8"	sf	5,530	0.60	0.65
8"	sf	1,220	0.70	0.75
Seats, stadium	lf	63,200	1.20	1.40
Fence & gates, relocate	lf	1,680	3.00	1.00
PCP, san sew 6"	lf	260	1.60	1.60
8"	lf	700	2.00	2.00
Manhole, I.D. 3'-6"	vf	28	35.00	33.00
Plumbing	ls	job	42,639	51,000
Handrails & stiles	lb	22,520	0.45	0.40
Grills, ventilation	ea	20	42.00	40.00
Ducts, air intake	ea	4	300.00	330.00
Gate, folding	ea	1	330.00	300.00
Flag pole	ea	1	640.00	600.00
Seats, box	ls	job	5,752	6,000
Benches, players	ea	24	17.25	30.00
Dist sys, high volt	ls	job	25,339	20,000
Lgt sys, field	ls	job	113,397	114,000
& pwr sys, area & int	ls	job	42,117	44,000
PA sys	ls	job	5,113	7,000
Press box, ticket booth	ls	job	83,687	86,000
Rest rooms	ls	job	62,637	18,000
Stands, concession	ls	job	25,545	40,000
Track, running	ls	job	19,000	16,000

Completion time: 360 calendar days
Liquidated damages: $200 per day

Water Storage Additions At $126/Mgal of Capacity

Woonsocket, R. I., is spending $188,300 for a 750,000-gal-capacity elevated tank and a 750,000-gal steel reservoir to supplement and extend the community's water service. Metcalf & Eddy, Boston, is the consultant.

The award at $188,300 to Pittsburgh-Des Moines Steel Co. is 1.4% under the engineers estimate, and averages a capacity cost of $125.55 per M gal.

The spheroidal tank will be 43 ft high from top of footings. The 64 ft-dia reservoir will be 32 ft high.

Bids were taken on March 8 and 180 days are allowed for completion. Liquidated damages are $25 per day.

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Model Series	RF-192	BCF-182	B-184	B-182	B-164
Gross Vehicle Rating	43,000	35,000	24,000	21,000	19,000
Body	8-10 Yd.	8 Yd.	4 Yd.	4 Yd.	4 Yd.
Wheelbase	157 in.	149 in.	141 in.	141 in.	129 in.
Engine	450 cu. in.	345 cu. in.	345 cu. in.	345 cu. in.	304 cu. in.
Transmission	5-speed Direct, 3-speed Auxiliary	5-speed Direct, 3-speed Auxiliary	5-speed Direct	5-speed Direct	4-speed Synchro-mesh
Rear Axle and Capacity	34,000 single-reduction tandem	28,000 single-reduction tandem	18,500 2-speed	16,000 2-speed	15,000 2-speed
Tires	9.00 x 20 10 ply	9.00 x 20 10 ply	10.00 x 20 12 ply	9.00 x 20 10 ply	8.25 x 20 10 ply
Frame Reinforcements	Inverted "L"	Inverted "L"	Inverted "L"	Inverted "L"	Inverted "L"
Heavy Duty Springs			Front & Rear	Front & Rear	Front & Rear

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Baltimore.....e	98.00	98.00	102.50	100.00	108.00	108.00	125.00		
	118.00g	*122.00g*	*125.00g*	*120.00g*	*126.00g*	*126.00g*	*150.00g*	*$180.00*	*$170.00*
Birmingham....n†r	85.00	87.00	84.00	86.00	91.00	97.00	116.00		
	80.00	*80.00*	*88.00*	*81.00*	*81.00*	*98.00*	*88.00*	*85.00*	*95.00*
Boston.....ns	104.00f	104.00f	104.00f	104.00	104.00f	122.00s	.....	.....	.....
	108.00	*108.00*	*114.00*	*114.00*	*114.00*	*126.00*	*152.00*	*154.00*	*170.00*
Chicago.....**	115.00	118.00	112.00	125.00	134.00	135.00	130.00		
	121.00	*121.00*	*154.00*	*132.00*	*132.00*	*133.00*	*141.00*	*141.00*	
Cincinnati.....n*	102.50	103.75	96.50	98.00	104.75	112.75	121.00		
	105.50	*109.00*	*106.00*	*109.75*	*111.50*	*116.50*	*148.00*	*149.50*	*149.50*
Cleveland.....e**	98.00	100.00	100.00	98.00	102.00	108.00	.....	.....	.....
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Dallas.....‡	95.00k	99.00k	103.00k	103.00k	103.00k	108.00k	135.00		
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Detroit.....‡	140.00	142.50	142.00	138.00	145.50	145.00	.....	.....	.....
	132.25	*152.25*	*143.25*	*141.50*	*150.00*	*155.50*	*194.00*	*211.00*	*211.00*
Kansas City....tx	120.00	120.00	120.00	125.00	128.00	150.00	.....	.....	.....
	180.00	*180.00*	*180.00*	*195.00*	*198.00*	*198.00*	*165.00*	*225.00*	*225.00*
Los Angeles....znu	*94.00*	*94.00*	*94.00*	*94.00*	*94.00*	*94.00*	*130.00*	*140.00*	*140.00*
Minneapolis....os	*140.00*	*140.00*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*
Montreal.....*bp	83.00s	89.00s	83.00s	83.00s	99.00s	125.00s	.....	.....	.....
	160.00	*160.00*	*160.00*	*160.00*	*160.00*	*160.00*	*165.00*	*170.00*	*170.00*
New Orleans...†n	89.00	89.00	90.00	95.00	95.00	98.00	128.00		
	108.50	*108.50*	*108.50*	*108.50*	*108.50*	*106.00*	*122.00*	*115.50*	*115.50*
New York.....	112.50	115.00	118.00	124.00	124.00	127.50	225.00		
	.....	.....	*118.00*	*120.00*	*120.00*	*123.00*	*169.00*	*174.00*	*178.00*
Philadelphia....nl	110.00	112.00	112.00	110.00	112.00	110.00	125.00	.....	.....
	.....	.....	*125.00*	*125.00*	*125.00*	*125.00*	*145.00*	*145.00*	
Pittsburgh.....sl	135.00	135.00	135.00	135.00	140.00	140.00	165.00		
	135.00	*115.00*	*145.00m*	*150.00*	*150.00*	*150.00*	*225.00*	*225.00*	*225.00*
St. Louis.....tn	113.00	115.00	123.00d	123.00d	123.00s	122.00s	.....	.....	.....
	.....	.....	*132.00*	*132.00s*	*132.00s*	*132.00s*	*166.00s*	*166.00s*	*166.00*
San Francisco..nz	*68.00*	*68.00*	*81.00*	*81.00*	*81.00*	*81.00*	*90.00*	*112.00*	*112.00*
Seattle.....n†	*55.00*	*58.00*	*69.00*	*69.00*	*69.00*	*72.00*	*82.50*	*87.50*	*87.50*
Toronto.....*	82.00s	84.00s	82.00s	81.00s	83.50s	83.50s	96.00s	.....	.....
	89.00	*92.00*	*100.00*	*100.00*	*108.00*	*104.00*	*135.00*	.....	.....

LONG LEAF Y. P. Merchantable grade up to 20 ft.		FIR PLYWOOD ½" Interior plyscored, C-D gr.	¾" Ply-form grade*
2x12 Rgh	12x12 Rgh		
$135.00	$155.00	$125.00	$270.00
175.00	190.00	175.00	275.00
120.00	173.00	120.30	204.50
.....	.....	160.00r	290.00r
158.00	158.00	147.00	230.00
138.00	128.00	92.00f	170.00f
.....	.....	121.00s	205.00
138.00	180.00	112.50sr	200.00sr
.....	.....	146.50s	223.00s
153.50	.....	120.00prs	209.00prs
.....	.....	135.00s	215.00s
.....	.....	120.00	210.00
.....	.....	195.00	305.00
120.00	120.00	119.25	225.95
180.00	180.00	119.19	200.71
250.00s	250.00s	119.20	202.50
.....	.....	138.00hs	220.00hs
145.00	185.00	225.00s	295.00s
.....	.....	182.30sch/	244.00sch
.....	.....	92-94h	170/
.....	.....	110.00sap	200.00sap
		218.00	261.00

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL.

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. [a] Spruce. [b] Federal tax exempt, add 8% mun. & prov. tax. [c] 5M lots. [d] 8, 10, & 12 ft. lengths. [e] 8 to 16 ft. lengths. [f] Hemlock [g] No. 1 common. [h] 8 ft. lengths. [k] No. 3 common. [m] Add 2% sales tax. [n] Less 2% disc. 10 days. [o] Less 2% disc. 10th. [p] Less 1% disc. 10 days. [q] fir: $90.25 in truck lots, fob job or CL, f.o.b. city. [r] For f.o.b. city price add $8 for pine, $38 for fir eff. 1/1/58. [s] and truckloads. [t] trucklots del. [u] Retail LCL yard. [v] Retail LCL, del. [w] add 6% mun. & Prov. tax. [x] add 4% sales tax. [z] Hondouras Pine.

* PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, interior, moisture resistant, ¾", $146.00; ¾", $186.00 Exterior, waterproof, ¾", $150.00; ¾", $187.00. [a] Delivered. [c] Truck lots. [d] A-C exterior. [s] LCL. [f] less 1½, 5 days. [g] less 2% for cash. [h] less 2% disc, 10 days. [k] add 2% sales tax. [j] f.o.b. mill

GLASS, EXPLOSIVES, CHEMICALS, PILES, TIES

WINDOW GLASS

Discounts from jobbers' list, Feb. 1, 1958a

	Single or Double Strength A quality	Single or Double Strength B quality
Atlanta	78%	80%g
Baltimore	74%d	74%d
Birmingham	82% f	82% f
Boston	73+10%p	73+10%p
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74-2-10%	74-2-10%
Dallas	76%	76%
Denver	73.5%	73.5%
Detroit	72-10-10%	72-10-10%
Kansas City	76-10-10%	76-10-10%
Los Angeles	$12.88/17.32h	$10.45/14.13h
Minneapolis	71-10%	71-10%
Montreal	40-10-5%b	40-10-5%b
New Orleans	78%o	78%o
New York	79%	79%
Philadelphia	78%g	80%g
Pittsburgh	72%	73%
St. Louis	72-10-10%mo	72-10-10%mo
San Francisco	60%	73%
Seattle	$8.85/11.85hiq	$8.41/8.67hip
Toronto	$6.49/9.57h	$5.90/8.70h

EXPLOSIVES

	Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 500 lb. lots	
Atlanta	$0.2595	Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.
Baltimore	.2795	
Birmingham	.2595	
Boston	.2795	
Chicago	.2795	
Cincinnati	.2595	
Cleveland	.2595	
Dallas	.2870	
Denver	.2795	
Detroit	.2795	
Kansas City	.2795	
Los Angeles	.2795	
Minneapolis	.2795	
Montreal	23.30h	
New Orleans	.2795	
New York	.5130g	
Philadelphia	.2795	
Pittsburgh	.2595	
St. Louis	.2795	
San Francisco	.2795	
Seattle	2795	
Toronto		

Glass: [a] Jobbers' list price per box, 14 x 20, sa. $42.75 for A quality, $37.80 for B quality; 14 x 20, da, $60.00 for A quality, $52.75 for B quality. [b] sales tax extra. [c] 77% for single strength. [d] From 8/15/52 list. [e] 77% for double strength. [f] Single strength; double strength, 83%. [g] From 8/1/58 list. [h] sa/da, 40-in. [i] 20 boxes min. [j] CL quantity. [k] eff. 12/58. [l] eff. 10/15/58. [m] less 2% disc, 10 days. [n] less 1% disc, 10 days. [o] add 2% sales tax. [p] less 1% for cash. [q] less 2% for cash [s] deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. [h] F.o.b. Below (near Montreal), per 100 lb., lots under 2000#, wood cases, forcite, 40%. Forcite 60%, $24.30 in fiber cases: forcite 40%, $24.05; forcite 60%, $25.80.

40% Ammonia Gelatin price ranges in other than urban areas, per lb: (except Seismograph Grades)

	C/L 300,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*	$0.2095	$0.2195	$0.2545	$0.2695
Group 2†	.2170	.2270	.2620	.2770

*All areas except those in Group 2 and N.J. cities of Bayonne, Hoboken, Jersey City, No. Bergen, Union City and Weehawken †Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucie and south thereof; Idaho; Maine; Montana; New Mexico counties of Catron, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cattle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson Milan, Robertson, Leon, Houston, Angelina, Nacodoches, Shelby and south thereof

PILES

Prices per linear foot, fir and pine, rough peeled, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine under fifty feet based on freight from mid-South, over fifty feet, on freight from deep South.

Dimensions	Points	Length	By Rail Pine*§ R	By Rail Fir R
12" at butt	6-in.	30 to 39-ft.	$0.42a	....
12"—2-ft. from butt	6-in.	40 to 44-ft.	.91	....
12"—2-ft. from butt	6-in.	45 to 49-ft.	.97	....
12"—2-ft. from butt	6-in.	50 to 54-ft.	1.01	....
12"—2-ft. from butt	6-in.	55 to 59-ft.	1.07	....
14"—2-ft. from butt	6-in.	60 to 64-ft.	1.14	....
14"—2-ft. from butt	6-in.	65 to 69-ft.	1.21	....
14"—2-ft. from butt	6-in.	70 to 74-ft.	1.34	1.40
14"—2-ft. from butt	6-in.	75 to 79-ft.	1.41	1.40
14"—2-ft. from butt	5-in.	80 to 84-ft.	1.54	1.45
14"—2-ft. from butt	5-in.	85 to 89-ft.	1.67	1.54

* Pine piling over 90 feet available only in limited quantities. § ASTM Class B
* a, trucked in from N. J.

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

		8' x 8" x 8' Untr.	8' x 8" x 8' Tr.	7' x 9" x 8'6" Untr.	7' x 9" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.75
Chicago	Red Oak	2.85-3.00	4.00a-4.10	3.90	4.75-5.00
New York	Mixed Hardwood	3.45	5.10	4.30	6.50
	Mixed Oak	3.55	5.20	4.40	6.60
Philadelphia	Mixed Oak	3.80 i	3.97	....	4.57
St. Louis	Mixed Oak	2.65	3.75a	3.10h	4.20ah
San Francisco	Douglas Fir	1.95ef	3.15ef	2.25ef	3.40cu

Tr.—Treated; Untr.—Untreated. a Creosoted. c Empty coil. e Green f.o.b. cars. c 7 x 9 x 8'6" * Add 75c/tie freight charge to Birmingham. [h] 7" x 9" x 9½". [i] Mixed Hardwood

CHEMICALS

Water, sewage treatment, road work, carlots, f.o.b. works

Chlorine cylinders, liquid, per lb. freight allowed, N.Y. State	$ .11
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, ton	32.00
Silicate of soda, 52 deg., in drums, per 100 lb.	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.90
Sulphate of aluminum, commercial, in 100-lb. bags	2.05
Sulphate of copper in bags, 99% per 100 lb., reg., 25.2% copper content	13.00

See following ENR issues for OTHER PRICES:

- Wage Rates, Building Board, Lath, Insulation: Last, Sep. 29; Next, Oct. 3.
- Cement Aggregate, Ready-Mixed Concrete; Asphalt; Last, Oct. 6; Next, Nov. 10.
- Iron & Steel Products, Pipe: Last, Oct. 13; Next, Nov. 17.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Sep. 29; Next, Oct. 27.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—SLC

▲ **Mass., Fitchburg**—PLANT—Fitchburg Paper Co., 642 River St., soon lets contract, manufacturing plant. $1,000,000. Lockwood Greene Engineers, Inc., 316 Stuart St., Boston, Mass., engr. CD 7/15/59.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Otisville**—GYMNASIUM, etc.—BA 11/2—State Dpt. P. Wks., State Office Bldg., Albany, Gymnasium Bldg. No. 104, School Bldgs. No. 105, 106, 107; 25 boy cottages, Bldgs. No. 111, 112, 113, 114, 115, incld. service connection and imprvt. of grounds, Otisville Training School. $2,500,000. Plans deposit $50 general, $30 heating, $20, sanitary and $20 electrical. CD 6/14/48.

▲ **N. Y., Buffalo**—LIBRARY—BA 11/15—Bd. Supervs. Buffalo and Erie Co., Library Bd., general contract, heating and ventilation, sanitary, electric, elevators, escalators and bookstacks public library. $7,500,000. Plans deposit $50. James W. Kideney & Assocs. and Paul H. Harbach and Elon B. Clack Jr. Associated Archts., 418 Jackson Bldg., Zone 2, archts. CD 1/22/59.

▲ **N. Y., New York**—ALEXANDER HAMILTON HOUSES—BA 11/15—New York City Housing Auth., Rm. 312, 299 Broadway, Zone 7, fdns. and general contract, heating and ventilating, electrical work, plumbing work Alexander Hamilton Houses, Proj. No. NYS-81, Section I, which includes Bldgs. Nos. 4 and 5, incl. stores, boiler room and Community Center, easterly portion of area W. 143 St. 7 Ave., W. 141 St. and 8 Ave., Manhattan Boro. Plans deposit $75. CD 11/20.

HEAVY CONSTRUCTION—LB & CA

▲ **Warshaw Constr. Corp., Warshaw Bros., Inc. & Federal Constr. Corp.**, 101 Park Ave., New York 17, N. Y., LB $1,387,455, (4 bidders), platform extensions to subway stations of New York City Transit Sys., I. R. T. Div., Bronx Boro, Contr. C-141, NEW YORK, N. Y. New York City Transit Auth., Rm. 1310, 370 Jay St., Brooklyn 1, N. Y. Bids Oct. 7. CD 9/2.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 10/6,

N. J.—Yonkers Contg. Co., Inc., 969 Midland Ave., Yonkers, N. Y., LB $2,127,704, (10 bidders), paving and incl. work 4.978 mi. Interstate Rte. 78 from Central R.R. of New Jersey to Mulhockaway Creek in Jugtown Mountain Area, Hunterdon Co.;

N. J.—Franklin Contg. Co. Rte. 46, Box 176, Little Falls, N. J., LB $1,071,975, (8 bidders) wid'n., resurf. and bridges 2.469 mi. Rte. 28 Sections 3A and 4A, from East St. to Lincoln Ave., boroughs of Bound Brook and Middlesex, Somerset and Middlesex Counties. CD 9/16.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, Bids opened 10/4,

Lycoming Constr. Co., Williamsport, Pa., LB $1,828,024, (8 bidders), grade, drain, surf. 2.7 mi. Baltimore Beltway and southbound lane of Jones Falls Expressway, incl. steel beam bridges near Baltimore. B-635-29-99-420-B-635-29-75-76-77-78-415, Baltimore Co. CD 9/13.

▲ **Joseph Reddington**, 1550 Upshire Rd., Baltimore 18, Md., CA $1,098,183, Contr. 1590, paving Patapsco Ave., BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Sept. 7. CD 9/12, under LB.

▲ **Wright Contg. Co.**, Odenton, Md., CA $4,845,514, Jones Falls Expressway, Sta. 272 to 317 and 350 to 381, Cold Spring Interchange, incl. 4 bridges, BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Sept. 14. CD 9/16, under LB.

BUILDINGS—LB & CA

▲ **Joseph-Martin Assocs.**, c/o George Nemeny, Samuel Paul and Seymour Jarmel, archts., 89-51 164 St., Jamaica, N. Y., Owner Builds, $1,000,000, Forest Hills MOTOR HOTEL, 2 acre tract at Long Island Expressway and 108 St., FOREST HILLS, N. Y.

▲ **Stewart M. Muller Constr. Co., Inc.**, 190 East Post Rd., White Plains, N. Y., CA $2,500,000, 2 story DINING HALL, AUDITORIUM, TARRYTOWN, N. Y. Marymount College, Tarrytown, N. Y. (Correction—contractors address). CD 9/8, under CA.

▲ **Eliott House Corp.**, 180 So. Broadway, White Plains, N. Y., Owner Builds, $2,000,000, 14 story, 197 unit APARTMENT, Washington St., EAST ORANGE, N. J. Gerber & Pancani, 11 Commerce St., Newark, N. J., archts.

▲ **Badger Mfg. Co.**, 230 Bent St., Cambridge, Mass., CA Over $3,000,000, design and construct PLASTICIZERS PLANT, Logan Twp., SWEDESBORO, N. J. Monsanto Chemical Co., 445 Park Ave., New York, N. Y. CD 9/9.

▲ **Stoffet & Tillotson**, 2043 Eastburn Ave., Phila., Pa., LB $2,057,000, 3 DORMITORIES, DINING HALL and STUDENT UNION, JENKINTOWN, PA. Beaver College, Jenkintown, Pa. Allaback & Renis, 16 S. Broad St., Phila., Pa., engrs. CD 12/4.

▲ **Baltimore Contractors, Inc.**, 711 S. Central Ave., Baltimore 2, Md., CA $1,250,000, masonry, concrete, steel, Montgomery-Ward STORE, Joppa Rd. and Goucher Blvd., near TOWSON, MD. Eudowood Shopping Plaza, 355 Lexington Ave., New York 17, N. Y.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Virginia**—BA 10/25—U. S. Eng., 502 8th St., Huntington 1, W. Va., intake structure, dam and spillway for John W. Flannagan Dam and Reservoir Proj., Pound River, CIVENG-46-002-61-15. $6,500,000. Extended date. CD 9/15.

HEAVY CONSTRUCTION—LB & CA

▲ **Atlantic, Gulf & Pacific Co.**, 15 Park Row, New York 38, N. Y., CA $1,412,920, dredging filling Port of Miami-Dodge Island, MIAMI, FLA. Bd. Comrs. Dade Co., 10th Floor Courthouse, Miami, Fla. Ewin Eng. Co., DuPont Plaza Center, Miami, Fla., engr. Bids Sept. 13, awarded Oct. 3. CD 9/20, under LB.

▲† **Williams McWilliams, Inc.**, Box 584, New Orleans, La., LB $1,391,799, est. $2,500,000, (8 bidders), removal and satisfactory disposal by hydraulic dredge 11,357,000 cu. yd. material, Mississippi River Gulf Outlet Channel, St. Bernard Parish, CIVENG-16-047-61-29, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Oct. 4. CD 9/9.

BUILDINGS—LB & CA

▲ **R. H. Pinnix Co.**, P.O. Box 97, Gastonia, N. C., LB $1,012,912, GERONTOLOGY BLDG., DURHAM, N. C. Duke University, Admin. Bldg., Durham, N. C. Bids Sept. 30. CD 9/21.

▲ **A & W Realty Co.**, Gastonia, N. C., Owner Builds, $2,000,000, SHOPPING CENTER addn., GASTONIA, N. C. James C. Wise, 873 Spring St., Atlanta, Ga., archt.

▲ **Boyle Constr. Co.**, P.O. Box 471, Sumter, S. C., CA $1,838,400, six DORMITORIES for St. Andrews Presbyterian College, LAURINBURG, N. C. Consolidated Presbyterian College Fund, Inc., Laurinburg, N. C. Bids Sept. 30. CD 9/21.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**
PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

▲ **Black & Frazier**, P. I. Box 3028, Decatur, Ga., Owner Builds, $1,500,000, 50 RESIDENCES, Burnt Leaf Lane subdivision, DECATUR, GA.

▲ **A. D. McTindal**, 649 Lakeside Dr., Hapeville, Ga., Owner Builds, $2,000,000, 200 APARTMENT units, HAPEVILLE, GA. CD 10/5.

▲ **Power Service Corp.**, Wesley Temple Bldg., Minneapolis, Minn., CA $1,655,000, STEAM ELECTRIC POWER PLANT, VERO BEACH, FLA. City, City Hall, Vero Beach, Fla. (Correction—Contractor). CD 9/16, under CA.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., State Depts. Bldg., Columbus, Zone 15,

O.—V. N. Holderman & Sons Co., 890 Park Ave., Columbus, O., CA $868,547, Type T 34 on B 70, structure, 0.481 mi. State Rte. 3, Section 16.69, 170-6(4)98, Proj. 616 Franklin Co.;

O.—The DeSalvo Constr. Co., Inc., 3701 Red Bank Rd., Cincinnati, O., CA $2,629,000, Type T 71, structures, 4.535 mi. USR 52, Section 2.52, I 74-1 (4)02, Whitewater and Harrison Twps., Proj. 618, Hamilton Co.;

O.—Engle Constr. Co. and Standard Asphalt & Tar Co., P. O. Box 5, McArthur, O., CA $1,014,964, Type T-35, on B 20, structure 5.534 mi. SR 76, Section (4.62-4.66) S 181(7) Barlow and Dunham Twps. Proj. 619, Washington Co. Bids Aug. 23. Grand total $4,512,511. CD 9/1, under LB.

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15,

O.—Harry Miller Excavating Co., Inc. and Earl H. Newell & Sons, 116 Woodland Ave., Columbiana, O., CA $743,744, Type T 34, structures, 4.149 mi. SR 43, Sections (16.19) (20.45) S-227(2) Harrison and Brown Twps., Proj. 692, Carroll Co.;

O.—Silvestri Bros., 713 Andrews Ave., Youngstown, O. CA $1,298,913, Type T 71, structures 1.032 mi. SR 7, Section 14.80, I-680-9(3)223, City of Youngstown, Proj. 694, Mahoning Co. Bids Sept. 27. CD 10/5, under LB.

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15,

Visintine & Co., 1315 Edgehill Rd., Columbus, O. CA $1,649,000, Type T 71, structure 0.218 mi. SR 3, Section 18.17, I-71-3(22)110, City of Columbus, Proj. 655, Franklin Co. Bids Sept. 13. CD 9/22 under LB.

▲ **INDIANA**—State Hy. Dpt., State House Annex, Indianapolis,

Moellering Constr. Co., Engle Rd., Fort Wayne, Ind., CA $2,041,053, conc. pavement, Contract R 5013, Allen Co. Bids June 28. CD 7/6, under LB.

▲ **Kenny Constr. Co.**, 3220 Oakton St., Skokie, Ill. LB $2,035,925, (15 bidders) No. 066-1315, CF, c. conc. paving, bit. paving, 13,230 ft. storm sewers, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill., Bids Oct. 4, CD 9/21;

Rock Road Constr. Co., 5935 N. Rogers Ave., Chicago, Ill., LB $1,631,626, (12 bidders), No. 267A-010.9-CF, dual concrete paving, 20,070 ft. 10- to 48-in. storm sewers, (Chicago, Ill.);

Arcole Midwest Corp., 3225 Main St., Skokie, Ill., LB $249,409, No. 130-1920-MFT, bit. paving 5,612 ft. storm sewers, 8,778 ft. curb and gutter (Chicago, Ill.).

▲ **Arcole-Midwest Corp.**, 3225 Main St., Skokie, Ill., LB $361,135, (7 bidders), No. 267A-0101.8-CF, 3-span concrete bridge; LB $242,278, est. $200,000 (9 bidders), No. 066-1212-CF, single span deck plate girder bridge, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill. Bids Oct. 4, CD 9/21;

Thomas McQueen Co., 1313 Circle Ave., Forest Park, Ill., LB $1,037,919, (13 bidders), No. 066-1313.2-CF, overpass to carry South Expressway over C.R.I. R.R., (Chicago, Ill.);

Plainfield Bridge & Constr. Co., Mill Rd. and Rte. 66, Plainfield, Ill., LB $203,884, No. 016-3434.1, Wolf Rd. bridge (Chicago, Ill.);

W. J. Sheppard & Co., 1412 W. Altgeld St., Chicago, Ill., LB $169,747, est. $100,000, (5 bidders), No. 249-0303; 013-0808; 250-0101; three concrete slab bridges, McDonald Creek, (Chicago, Ill.);

Herlihy Mid-Continent Corp., 407 S. Dearborn St., Chicago 5, Ill., LB $217,354, est. $358,000, (9 bidders), No. 066-1515.2CF, single span concrete highway bridge, (Chicago, Ill.).

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing, Bids opened 10/5,

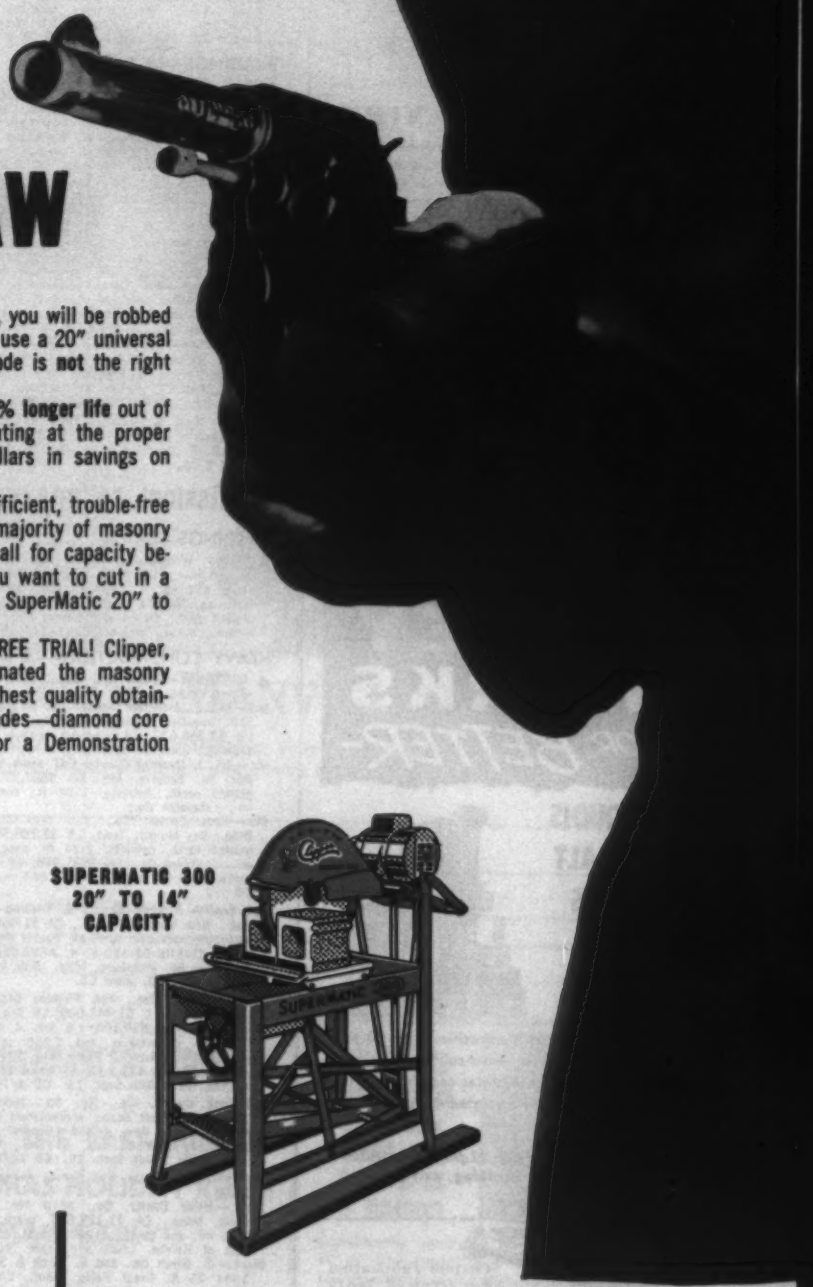
Mich.—Kenny Constr. Co., 408 Moss Ave., Indianapolis, Ind., LB $3,952,031, 4.6 mi. roadway and ramps on Detroit-Muskegon Freeway from Bristol Rd. east to Grand River north of Grand Rapids, Kent Co.;

Mich.—Thornton Constr. Co., Hancock, Mich., LB $960,200, 10.4 mi. US 27 freeway from Higgins Lake State Park Rd. in Roscommon County north to M-76 in Crawford Co., Crawford and Roscommon Counties; LB $1,293,623, 6.2 mi. from point ½ mi. south of Roscommon-Crawford County line north to M-76 Crawford and Rosmommon Counties;

(Continued on page 90)

WHAT?

ROBBED BY A MASONRY SAW



Yes, if a 14" masonry saw meets your requirements, you will be robbed of dollars . . . many dollars . . . if you purchase and use a 20" universal saw. It's very simple. The right speed for a 20" blade is **not** the right speed for a 14" blade.

Independent laboratory tests prove you get **32.7% longer life** out of a 14" blade when you use it on a 14" saw operating at the proper speed. This can easily add up to hundreds of dollars in savings on one job alone.

Clipper SuperMatic 14" Hi-Speed is the most efficient, trouble-free masonry saw ever built. It's the saw for the great majority of masonry saw users. But, Clipper realizes that certain jobs call for capacity beyond 14"; for instance, a large block job where you want to cut in a single pass. That's why Clipper also offers you the SuperMatic 20" to 14" universal saw.

Only Clipper offers you this choice—and on FREE TRIAL! Clipper, with its Engineering Leadership by men who originated the masonry cutting industry and know it best, bring you the highest quality obtainable in masonry and concrete cutting saws and blades—diamond core bits and drills. Call Collect Today for Free Trial or a Demonstration on your job.

HI-SPEED SUPERMATIC 314 14" CAPACITY

SUPERMATIC 300 20" TO 14" CAPACITY

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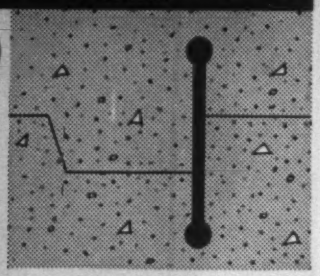
WATERSTOPS

FOR MASONRY CONSTRUCTION JOINTS



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• Tunnel Forms • Industrial Heating • Foundry
• Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.

(Continued from page 88)

Mich.—C. F. Replogle Co., Circleville, O., LB $3,589,224, 4.1 mi. US 27 freeway, incl. seven structures from near M-68 south of Indian River north to connect with 21 mi. section, Cheboygan Co.;

Mich.—Cooke Contg. Co., 1116 Penobscot Bldg., Detroit, Mich., LB $2,376,634, 14.7 mi. US 10 freeway from M-18 in Midland County northwesterly across Isabella and Clare Counties to connection with US 27 freeway at Clare, Isabella, Clare and Midland Counties;

Mich.—Gilliland Constr. Co., RFD 2, Alpena, Mich., LB $1,192,456, 12.7 mi. reconstr. M65 incl. grading, drainage structures and surf. from Posen in Presque Isle County south intermittently to Lachine in Alpena Co., Alpena and Presque Isle Counties. CD 9/28.

▲† Great Lakes Dredge & Dock Co., 228 N. LaSalle St., Chicago, Ill., CA $1,094,565, dredging west approach to Locks, St. Marys Falls Canal, St. Marys River, Sault Ste. Marie, CIVENG-20-064-61-10, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit 31, Mich. Bids Sept. 29. CD 10/3, under LB.

BUILDINGS—LB & CA

▲ W. B. Gibson Co., 200 W. Chestnut St., Warren, O., CA Est. $5,000,000, SHOPPING CENTER, 38 acre site, northeast corner Glendale Ave. and Byrne Rd., south Toledo, TOLEDO, O. Don Castro, 42 S. 4th St., Columbus, O., and W. B. Gibson Co., 200 W. Chestnut St., Warren, O. C. Melvin Frank, 1650 W. 5th Ave., Columbus, O., archts. CD 8/29/57.

▲† F. D. Rich Co., 550 Summer St., Stamford, Conn., LB $4,138,200, Base bid, (8 bidders), FEDERAL OFFICE, TOLEDO, O. General Services Admin., 219 S. Clark St., Chicago, Ill. Bids Oct. 6. CD 9/8.

▲ Henry J. Spieker Co., 1418 Elm St., Toledo, O., CA $2,288,700, (7 bidders), general contract, Bowsher HIGH SCHOOL, Detroit Ave. and Glanzman Rd., TOLEDO, O. Bd. Educ., Manhattan and Elm Sts., Toledo, O. Bids Sept. 30, CD 9/7;
Johnson Plumbing & Heating Co., Inc., 2740 Nebraska St., Toledo, O., CA $572,720, plumbing, heating and vent. contract for HIGH SCHOOL (Toledo, O.).

▲ J. E. Buliders, 2199 S. Green Rd., Cleveland 21, O. Own Forces, $3,250,000, 325 suite APARTMENT DEVELOPMENT, Green St. between N. Miles and Emery Rds., WARRENSVILLE HEIGHTS, O. CD 3/22.

▲ Huber Hunt & Nichols, Inc., 2450 S. Tibbs St., Indianapolis, Ind., CA, TIRE FACTORY, FORT WAYNE, IND. B. F. Goodrich & Co., 500 S. Main St., Akran, O. CD 2/16.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ Minn., Winona—SCIENCE, etc.—BA 11/3—State Dpt. Admin., 19 State Capitol, St. Paul, 3 story, 66 x 257 sq. ft. science bldg. and industrial arts facilities, Winona State College, $1,085,150. Plans deposit $50. Eckert & Carlson, 300 Exchange Bldg., Winona, Minn., archts. CD 5/10.

HEAVY CONSTRUCTION—LB & CA

▲ MISSOURI—State Hy. Dpt., Jefferson City, bids opened 9/30,

Mo.—W. J. Menefee Constr. Co. & Koss Constr. Co., 510 Iowa-Des Moines Bank Bldg., Des Moines, Iowa, LB $2,366,637, (9 bidders), graded earth, culverts, 2-24 ft. concrete pavements 4.949 mi., Greene Co.;

Mo.—W. J. Menefee Constr. Co., 2500 W. 16 St., P.O. Box 30, Sedalia, Mo, LB $507,320, (6 bidders), graded earth, culverts, 1-24 ft. conc. pavt. 1.316 mi., Lafayette Co.;

Mo.—Koss Constr. Co., 510 Iowa-Des Moines Bank Bldg., Des Moines, Iowa, LB $1,785,557, (5 bidders), graded earth, culverts, 2-24 ft. conc. pavts. 15.132 mi., Stoddard Co.; LB $521,908, (5 bidders), graded earth, 2-24 ft. conc. pavts. 2.053 mi., Stoddard Co. CD 9/7.

▲† English Electric Export & Trading Co., 750 Third Ave., New York 16, N. Y., CA $1,464,829, est. $2,000,000, hydraulic turbines, Beaver Powerhouse, White River, CIVENG-03-050-61-4, ARKANSAS. U. S. Eng., P.O. Box 80, Vicksburg, Miss. Bids Aug. 30, awarded Oct. 3. CD 9/2, under LB.

▲† Weitz Co., Inc., 406 Fleming Bldg., Des Moines, Iowa, LB Sch. 1, $1,443,600; LB Sch. 2, $1,431,600; LB Sch. 3, $1,859,100; LB Sch. 4, $1,843,600, two 220-man dormitories and 7,250 sq. ft. rein.-con. dining hall, Offutt Air Force Base, ENG-25-066-61-22, FORT CROOK, NEB. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Sept. 13. CD 8/19.

▲† Cook Constr. Co., Hy. 80, Jackson, Miss., CA $1,418,400 First Stage, embankment and outlet works Council Grove Dam, Grand (Neosho) River, ENG-34-066-61-7, KANSAS. U. S. Eng., P. O. Box 61, Tulsa, Okla. Bids Sept. 29. CD 10/4, under LB.

▲ MONTANA—State Hy. Comn., Helena, Bids opened 9/28,

Mont.—Hilde Constr. Co., 3810 7th Ave. N., Great Falls, Mont., CA $1,129,813, grade, gravel, surface 2.81 mi. and construct 260.5½ ft. interchange southeast of Helena, Lewis and Clark Counties;

Mont.—S. Birch Inc. and S. Birch & Sons Constr. Co., 1004 15 N. Great Falls, Mont., CA $292,065, realign 0.8 mi. railroad track and grade, gravel and surface 3.9 mi. U.S. 89 south of Livingston, Park Co. CD 9/14.

▲† Cherf Brothers & Sandkay, Box 938, Eohrata, Wash., LB $1,395,336, est. $1,525,424, (15 bidders), relocating 15.2 mi. Union Pacific Railroad, Dillon, Missouri River Basin Proj., Spec. DC 5395, MONTANA. Bureau Reclamation, 128 S. Montana St., Dillon, Mont. Bids Oct. 6. CD 8/24.

▲ Robert E. McKee General Contractor, Inc., 221 Washington Ave., Santa Fe, N. M., CA $2,187,300, est. $2,268,900, South Side Sewage Treatment Plant on S. 2nd St., ALBUQUERQUE, N. M. City, City Hall, Albuquerque, N. M. W. F. Turney & Assocs., 312 Montezuma Ave., Santa Fe, N. M., engrs. CD 10/12/59.

BUILDINGS—LB & CA

▲ D. L. Witcher, Inc., 400 2 Ave. S., Minneapolis, Minn., CA $1,067,500 SENIOR HIGH SCHOOL, ST. ANTHONY, MINN. Bd. Educ. Independent School Dist. No. 283, St. Anthony, Minn. Bids Sept. 28. CD 10/5 under LB.

▲ Mercury Real Estate Co., 749 E. Big Bend Blvd., St. Louis 19, Mo., Owner Builds, Total cost $1,250,000 (3 year program), 84 brick, stone, concrete, etc. RESIDENCES, Granthaven Subdivision adjacent to General Grant Lane and Grand Park Dr., AFFTON (ST. LOUIS 23 P.O.), MO.

▲ C. Rallo Contg. Co., 5000 Kemper Ave., St. Louis 39, Mo., CA $1,188,471 general contract, 2 story GRADE and HIGH SCHOOL, incl. GYMNASIUM, CHAPEL, CONVENT southeast corner US 40 and Ballas Rd., TOWN AND COUNTRY (Clayton-St. Louis 24 P. O.), MO. Order of Visitation, Visitation Academy, 5448 Cabanne Ave., St. Louis 12, Mo. Bids Sept. 20 CD 9/1.

▲ Rob. M. McKee, Gen. Contr., Inc., Box 562, El Paso, Tex., LB $8,000,000, 18 story, 680,000 sq. ft. BANK and OFFICE EL PASO, TEX. El Paso National Bank, Texas and Stanton Sts., El Paso, Tex. Carroll & Daeuble & Associates, 1001 E. Yandell, El Paso, Tex., engrs. CD 9/8.

▲ Ramsey Steel Co., 4137 Rosa St., El Paso, Tex., CA $1,800,000, 75 x 800 ft. steel MILL, EL PASO, TEX. Border Steel Rolling Mills, Inc., 206 San Francisco St., Ramsey Steel Co., Edward J. Winter, El Paso, Tex. Grand total $3,925,000. (Correction—contractor's addresses). CD 9/28;
Border Steel Co., 206 San Francisco St., El Paso, Tex., CA $1,700,000, steel melt SHOP, (El Paso, Tex.);

J. E. Morgan & Sons, 215 Willow St., El Paso, CA $425,000, OFFICE-SHOP-STORAGE, (El Paso, Tex.)

▲ D. J. Rheiner Constr. Co., 409 Ins. Bld., San Antonio, Tex., LB $1,887,450, general contract SHOPPING CENTER unit, Loop 13 and Fred Rd., SAN ANTONIO, TEX. Community Realty Co., Wonderland Regional Shopping Center, 3022 E. Houston Tex., San Antonio, Tex., and Gerri Von Frellick, 42 Lakeside, Denver, Colo. CD 9/12.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

E. C. Young, 3256 F St., San Diego, Calif. and Muns Constr. Inc., P. O. Box 3697, San Diego, Calif., CA $3,117,296, 2.3 mi. freeway on U.S. Hy. 80, incl. five traffic separation and ramp structures, LaMesa, San Diego Co. Bids Sept. 22, awarded Oct. 3. CD 9/27, under LB.

▲ F. E. Young, P. O. Box 2872, San Diego 12, Calif., CA $2,675,000, Sch. 1, CA $464,922, Sch. 2 alternate 1, Miramar Filtration Plant and Reservoir, Miramar, SAN DIEGO, CALIF. City, Civic Center, San Diego 1, Calif. Bids Sept. 14, awarded Oct. 4. CD 9/20, under LB.

BUILDINGS—LB & CA

▲† Chevez Constr. Co., T. C. Bateson Constr. Co., Box 791, Mesa, Ariz., LB $3,258,400, est. $3,069,888, (1 bidder), Capehart HOUSING Proj., ENG. 04-353-61-7, FORT HUACHUCA, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Oct. 6. CD 10/3.

▲† H. R. McBride Constr. Co., 1133 Laguna St., Farmington, N. M., LB $1,119,100, (13 bidders), SCHOOL expansion or enlargement, proj. No. BU-603-590 TEEC NOS POS, ARIZ. Bureau Indian Affairs, Dpt. Interior, P. O. Box 8327, Albuquerque, N. M., Bids Sept. 28. CD 8/25.

▲ Vance Beaird, 5112 W. Washington Blvd., Los Angeles, Calif., CA $1,046,000, Proj. 1 Crescent JUNIOR HIGH SCHOOL, ANAHEIM, CALIF. Anaheim Union High School Dist., 123 North Citron Ave., Anaheim, Calif. Bids Sept. 30. CD 10/5, under LB.

▲ Williams & Burrows, 500 Harbor Blvd., Bellmont, Calif., CA Est. $2,000,000, RETIREMENT and RECREATION CENTER, incl. two 2 story APARTMENTS, 28,000 sq. ft. CLUB HOUSE, swimming pool, COMMERCIAL BLDGS., boat house, utilities, Clear Lake, LAKEPORT, CALIF. Plumbing & Pipe Fitting UA Local Union 38, 1621 Market St., San Francisco, Calif. Bids Sept. 13. CD 9/2.

▲ Moritor Constr. Co., 110 E. Victoria St., Suite 9, Santa Barbara, Calif., CA $1,200,000, SHOPPING CENTER, North "H" St., College to Dine Aves., LOMPOC, CALIF. Gordon L. MacDonald, 110 E. Victoria St., Suite 9, Santa Barbara, Calif.

▲ Jeanne Homes, 8737 Wilshire Blvd., Beverly Hills, Calif., CA $1,045,000, 95 stucco DWELLINGS, Tract 1112, NEWBURY PARK, CALIF. Lesser Enterprises, Inc., 8737 Wilshire Blvd., Beverly Hills, Calif. CD 9/12.

▲ Macco Corp., 3800 E. Coast Hy., Corona Del Mar, Calif., CA $1,660,000, 141 DWELLINGS, 1433 Mohawk Dr., Tract 3627, SANTA ANA, CALIF. Harrington Dev. Co., 3800 E. Coast Hy., Corona Del Mar, Calif.

▲ **Southwood Constr. Co.**, 2918 W. Compton, Gardena, Calif., CA $1,789,625, 104 stucco DWELLINGS, Tract 25788, TORRANCE, CALIF. Three Corps., 2918 W. Compton, Gardena, Calif.

CANADA

BUILDINGS—SLC

▲ **Que., Beaconsfield** — SHOPPING CENTRE — Ivanhoe Corp., 7101 Cote St. Luc, Montreal, soon lets contract 1 story, brick, concrete block shopping centre, Metropolitan Blvd. $1,500,000. Eliasoph & Berkowitz, 4950 Queen Mary Rd., Montreal, archts. CD 2/2.

HEAVY CONSTRUCTION—LB & CA

▲ **Foundation Co. of Ontario Ltd.**, 1220 Bay St., Toronto, Ont., LB $3,745,770, rein.-con. structural steel elevated structure, F. D. Gardiner Expressway, Station 257-09 to Station 267-64-39, Contract R-27-60, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Sept. 27. CD 9/9.

BUILDINGS—LB & CA

▲ **Bentall Constr. Co., Ltd.**, Transcona, Man., CA Est. $1,200,000, Northgate SHOPPING PLAZA, TRANSCONA, MAN. Allan Kilam & McKay Ltd., (managing agents) 292 Main St., Winnipeg, Man. CD 6/22.

▲ **Vernon C. Woodworth Ltd.**, Kentville, N. S., CA foundation contract for 96,000 sq. ft. structural steel frame, masonry PLANT, KENTVILLE, N. S. Fornex Co. of Canada, Kentville, N. S. Total est. $1,000,000, Percy Booth, 4795 St. Catherine St. W., Montreal, Que., archt. Webber & Harrington & Assocs., 311 Barrington Ave., Halifax, N. S. assoc. archts. T. Pringle & Sons Ltd., 4795 St. Catherine St. W., Montreal, Que., Industrial Consultants; **Dominican Structural Steel Ltd.**, Dartmouth, N. S. CA structural steel contract for PLANT (Kentville, N. S..).

▲ **Pigott Constr. Co., Ltd.**, 1250 Bay St., Toronto, Ont., CA Est. $2,500,000, 500,000 sq. ft. WAREHOUSE and OFFICE, OSHAWA, ONT. General Motors of Canada Ltd., William St. E., Oshawa, Ont. Bids Sept. 27, awarded Oct. 3. CD 9/21.

▲ **Pyramid Commercial Projects Ltd.**, 541 Brant St., Burlington, Ont., Owner Builds, $1,500,000, SHOPPING CENTER, 13,000 sq. ft. OFFICE, Kirkwood Ave., OTTAWA, ONT.

▲ **Dell Constr. Co., Ltd.**, 2461 Bloor St. W., Toronto, Ont., CA $5,749,000, 9 story, rein.-con. flat plate, concrete footings, exposed aggreg. concrete RIVERDALE HOSPITAL, Broadview Ave., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Sept. 20. CD 9/8.

▲ **Pigott Constr. Co., Ltd.**, 1250 Bay St., Toronto, Ont., CA Est. $6,000,000, 10 story, 257,000 sq. ft. steel frame OFFICE, Adelaide St. W., TORONTO, ONT. North American Life Assurance Co., 112 King St. W., Toronto, Ont. Marani, Morris & Allan, 1250 Bay St., Toronto, Ont., archts.

▲ **A. N. Bail Cie Ltee**, 2100 Mackay St., Montreal, Que., CA $1,650,000, HIGH SCHOOL, Beurling Ave., VERDUN, QUE. Verdun Catholic School Comn., 4480 Blvd. Champlain Verdun, Que. Bids Aug. 22. CD 9/8, under LB.

LATIN AMERICA

BUILDINGS—LB & CA

▲ **The Lummus Co.**, 2707 Weslayan St., Houston, Tex., U.S.A., CA Est. $3,500,000 four OIL REFINERY PROCESSING UNITS, BARRIOS, GUATEMALA. Refinera Matias de Galvez (Government), Barrios, Guatemala. CD 6/7;
International Constr. Assocs. Inc., Barrios, Guatemala, CA Est. $750,000, ground work, refinery concrete fdns. and setting up prefabricated OIL REFINERY ready for operation (Barrios, Guatemala).

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Agoura**—Las Virgenes Municipal Water Dist., 28320 Ventura Blvd., $6,000,000 bond election Oct. 11, WW imprvs.

▲ **Calif., Oakland**—Alameda County Flood Control & Water Conservation Dist., Courthouse, voted bonds water treatment plant, filtration plant, distr. reservoirs. $2,800,000. CD.

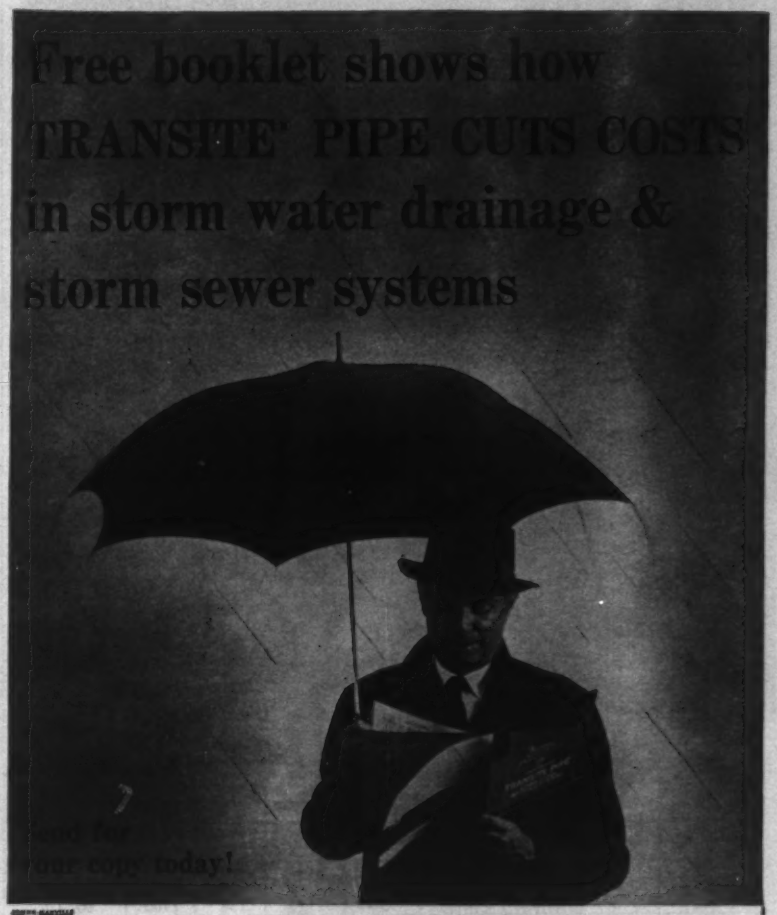
▲ **Calif., Somis**—Calleguas Municipal Water Dist., 3357 Somis Rd., $22,000,000 bond election Oct. 11, WW imprvs.

▲ **N. C., Winston-Salem**—City, City Hall, voted bonds Sept. 27, water filter plant, treated storage, reservoir, lines, raw water reservoir, $6,000,000. Platt & Davis Assocs., 111 Corcoran St. Bldg., Durham, consult. engrs. CD 8/30.

▲ **Wash., Woodinville**—Water Dist. No. 104, Rte. 2, P.O. Box 2054, $3,000,000 bond election Nov. 8, water supply, distr. system. Bids About Aug. 15, 1961. CD 3/1.

SEWERS, WASTE DISPOSAL

▲ **Ala., Cullman**—City, City Hall, sanitary sewage treatment plant addition and lines, $2,000,000. Harry



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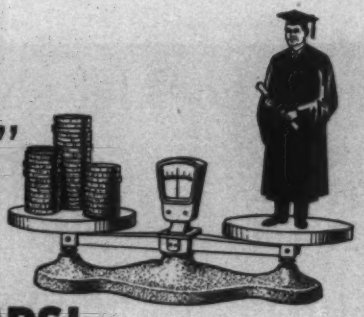

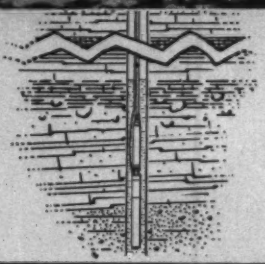

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3 A complete line to meet operating heads and capacities required.

Pump Type	Unit O. D.	Horsepower Range			Gallons Per Minute		Head In Feet	
		230 V 1 ph.	220 V 3 ph.	440 V 3 ph.	Minimum	Maximum	Maximum	Minimum
F-30AE	6"	5-7½	5-15	5-20	24	43	1600	220
D-33E	6"	5-10	5-20	5-40	28	56	2400	180
D-47E	6"	5-10	5-20	5-40	34	72	2000	140
G-70E	6"	5-10	5-20	5-40	42	100	1800	100
G-120	6"	5-10	5-30	5-40	93	158	1100	60
G-160	6"	5-10	5-30	5-40	86	186	900	60
I-200	8"	7½	7½-30	7½-40	80	272	800	80
FR-300	8"	7½	7½-40	7½-40	137	425	400	40
J-400	8"		15-40	15-40	265	625	240	40

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Hendon & Associates, 10 Office Park Circle, Mountain Brook, Ala., consult. engrs.

▲ **Ind., Marion**—City, City Hall, $4,100,000 bond election Nov. 8, sanitary sewer extensions. CD 1/8/58.

▲ **Kan., Kansas City**—City, City Hall, bond $15,000,000 election Nov. 8, First Phase, $15,000,000, sewage treatment to halt pollution of Kaw and Missouri River incl. 7 interceptor sewers, pumping stations and treatment plant. $25,000,000-$30,000,000. Truman Schlup, 1401 Fairfax Trafficway, Kansas City, Kan., consult. engr. CD 12/7/56.

▲ **N. Y., Colonie**—Village, Village Hall, sewerage sys. and treatment plant. $2,000,000. ($10,000 grant for plans and borings by State Dept. Public Works). CD 2/25/44.

▲ **N. Y., Hamburg**—Town, 501 S. Park Ave., Master sewer dist., disposal plant, trunk lines and street laterals. $4,000,000. Nussbaumer, Clarke & Velsey, 327 Franklin, Buffalo, and Herthe & Sonnenberger, 60 Niagara St., Buffalo, consult. engrs. Bids Spring 1961. CD 3/19/59.

▲ **N. Y., Leroy**—Village, Village Hall, voted bonds sewage treatment plant and sanitary sys. $2,150,000. Lozier & Co., 10 Gibbs St., Rochester, consult. engrs. CD 5/26/43.

▲ **Ore., Portland**—City, City Hall, $7,000,000 bond election Nov. 8, sewage treatment plant and collection sewers. CD 4/30/58.

▲ **Pa., Price**—Rostraver Township, Town Hall, sewage treatment plants, sanitary and intercepting sewers, $2,062,762.

EARTHWORK, WATERWAYS

▲† **Iowa**—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., Red Rock Reservoir, Des Moines River, $3,600,000. CD 9/9/57.

▲† **Iowa**—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., flood control, Little Sioux River, $2,300,000. CD 9/30/59.

▲† **Oklahoma**—Garfield County SCD, Enid, Noble County SCD, Perry, Pawnee County SCD, Pawnee, Black Bear Conservancy Dist., Perry, watershed protection, 241,546 acres, Upper Black Bear Creek, for Soil Conservation Service, $3,205,798.

▲† **Oklahoma**—Latimer County SCD, Wilburton, LeFlore County SCD, Poteau, watershed protection, Fourche Maline Creek, 175,360 acres, for Soil Conservation Service, $2,745,415.

▲† **Texas**—Plum Creek Conservation Dist., Lockhart, Hays-Caldwell-Travis Soil Conservation Dist., Route 1, Luling, watershed protection, Plum Creek, 97,000 acres, Hays, Caldwell and Travis Counties, for Soil Conservation Service, $2,801,149. CD 9/9/57.

† **Vermont**—U. S. Eng., 424 Trapelo Rd., Waltham, Mass., North Springfield Reservoir, Black River, $531,000. CD 9/29/59.

▲† **Virginia**—U. S. Eng., 237 4th Ave., Huntington 18, W. Va., John W. Flannagan (Pound) Reservoir, $3,100,000. CD 9/15/59.

▲† **West Virginia**—U. S. Eng., 502 8th St., Huntington 1, W. Va., Summersville Reservoir, Gauley River, $4,400,000.

▲† **Washington**—U. S. Eng., 1519 S. Alaskan Way, Seattle, Zone 4, Howard A. Hanson (Eagle Gorge) Reservoir, $4,400,000. CD 9/30/59.

▲† **Washington**—U. S. Eng., City-County Airport, Walla Walla, Ice Harbor Lock and Dam, Columbia River, $30,000,000. CD 9/29/59.

AIRPORTS

▲† **Fla., Cocoa**—OPERATIONAL, MAINTENANCE FACILITIES, etc.—U. S. Eng., 575 Riverside Ave., Jacksonville, airforce paving, hangar addn., plating shop, steam distr. system, sewage treatment plant, Missile data Collection Station altering, modifying missile lauching test facility, missile instrumentation cable facilities, missile instrumentation cable terminal building, addn., missile instrumentation bldg., missile pad warning system, warehouse, road, fence, Patrick Air Force Base, $8,020,000, funds released. CD 7/22.

▲† **Tex., San Antonio**—AERO MEDICAL BUILDING—U. S. Eng., 606 Sante Fe Bldg., Galveston, aero medical research bldg., officers quarters, Brooks Air Force Base. $7,860,000 funds released. CD 9/9/58.

UNCLASSIFIED

▲ **Calif., Los Angeles**—BOAT MARINA—Los Angeles Harbor Dpt., City Hall, 1793 boat marina, Cabrillo Beach, San Pedro. $6,157,942. Mofatt & Nichol, 122 W. 5 St., Long Beach, consult. engrs.

▲ **Oklahoma and Kansas**—PIPELINES—Panhandle Eastern Pipeline Co., 1221 Baltimore St., Kansas City, Mo., 150 mi. 24 in. and 50 mi. 22 in. gas pipe line from Elk City Field, Beckham Co., Okla. to Haven Compress Station, Reno Co., Kan. $15,700,000.

▲ **Wash., Seattle**—CONTAINERSHIP TERMINAL—Port of Seattle, Bell St. Terminal, bond election Nov. 8, containership terminal at West Waterway (Ames) terminal, $6,500,000; rebuilding Pier 28, $3,500,000. CD 5/28/59; third transit shed, East Waterway terminal, $850,000. CD 8/7. 59; improv. Hanford St. grain terminal, $500,000. CD 3/24/54.

PUBLIC BUILDINGS

▲ **Calif., Concord** — SCHOOLS — Mount Diablo Unified School Dist., 1936 Carlotta Dr., voted $8,000,000

bonds Sept. 27 and approved $8,000,000 State loan, schools. $16,000,000. CD 9/28.

▲ **Calif., Sunnyvale**—SCHOOLS—Sunnyvale Elementary School Dist., voted $2,000,000 bonds, two schools and addn. to existing bldgs. CD 10/24/58.

▲† **D. C., Wash.**—COURT OF CLAIMS—General Services Admin., 19 and F Sts. N. W., Zone 25, plans by Perry, Shaw, Hepburn & Dean, 31 St. James Ave. and Shepley, Bulfinch, Richardson & Abbott, 1 Court St., Boston, Mass., U. S. Court of Claims, S. E. corner Madison Pl. and H St. N. W. $6,350,000. CD 3/8.

▲ **Ga., Macon**—HOUSES—Macon Housing Auth., 1130 Oglethorpe St., plans by Dennis & Dennis, Bankers Insurance Bldg., W. Elliott Dunwody, 646 Arch St., and Ellamae Ellis League, 670 Mulberry St., 190 units, Housing Project G-74, Rock St., and Tyndall Heights area, $2,000,000, CD 1/28; 150 units, Housing Project G-77, Pleasant Hill area and Second St., $1,500,000, Armstrong & Edwards, 26 Peachtree Place N.E., Atlanta, Ga., consult. engrs.

▲ **Ind., Indianapolis**—SCHOOLS—Perry Twp. School Bldg. Corp., 1130 E. Epler Ave., grade school south of Thompson Rd., on Missouri Rd., $650,000; Junior High School, 5740 McFarland Rd., $2,400,000.

▲ **Ind., Indianapolis**—HIGH SCHOOL—Lawrence Twp. School Holding Corp., 7555 E. 56th St., high school, $2,000,000.

▲ **N. J., Jersey City**—ARTS AND SCIENCE, etc.—Jersey City State College, 2039 Hudson Blvd., plans by Ketchum & Sharp, 227 E. 44 St., New York 17, N. Y., 4 story arts and science; 5 story food service and dormitory; 2 story child study clinic, also alterations to existing bldgs., Jersey City State College. $3,864,000. Tectonic Assocs., U.S. Hy. 206, Somerville, N. J., consult. engrs. DiStasio & Van Buren, 136 Liberty St., New York 6, N. Y., structural engrs. CD 12/2.

▲ **N. J., Oak Ridge**—SCHOOL—Bd. Educ., Jefferson Twp., Longwood Valley Rd., referendum bonds and project Oct. 11, Junior-Senior High School. $2,100,000. Micklewright & Mountford, E. Stuyvesant, Trenton, archts.

▲ **N. J., Rahway**—HIGH SCHOOL ADDN.—Bd. Educ., 1012 Madison Ave., plans by Leslie Dennis, 134 Elmore Ave., Elizabeth, high school addn. $2,400,000.

▲ **N. Y., Greenburgh**—HOUSING—Greenburgh Housing Auth., Tarrytown Rd., Elmsford, 131 unit apartment, Old Tarrytown Rd. and Maple St. $2,050,000. CD 1/12/59.

▲† **N. Y., West Point**—CADET ACTIVITIES BLDG., etc.—U. S. Eng., 111 E. 16 St., New York 3, N. Y., plans by Gehron & Seltzer, 101 Park Ave., New York, Zone 17, cadet activities bldg. $8,200,000 no appropriation; student auditorium $7,500,000 no appropriation, U. S. Military Academy. Weiskopf & Pickworth, 230 Park Ave., New York, Zone 17, structural engrs. Guy B. Panero, 630 3 Ave., New York, Zone 17, mechanical engr.

▲ **Pa., Kutztown**—DORMITORY—General State Authority, 18th and Herr Sts., Harrisburg, plans by H. D. Dagit & Son, 1392 Race St., Phila., and George Ewing, 1720 Western Savings Fund Bldg., Phila., 3 dormitory buildings, 3 floors, bsmnt., for female students at Kutztown State College. $2,200,000. A. F. Jones, c/o owner, ch. engr. CD 3/17.

▲ **Tex., Dallas**—COURTHOUSE—Dallas County, Comrs. Court & Co. Judge, Courthouse, plans by Broad & Nelson, 1327 Merc., Dallas Bldg., Jack Corgan & Associates, 308 Tower Pet. Bldg.; and Smith & Warner, 306 N.W. 2nd St., Grand Prairie, county courthouse, Over $5,000,000. CD 5/28/59.

▲ **Utah, Salt Lake City**—CITY-COUNTY PUBLIC SAFETY—Salt Lake City Corp., City and County Bldg., Zone 1, plans by Harold K. Beecher & Assocs., Dooly Bldg., Zone 1, city-county public safety bldg. $6,000,000. CD 2/25.

COMMERCIAL BUILDINGS

▲ **Calif., Los Angeles**—APARTMENT—Louis Lesser Enterprises Ltd., 1150 S. Beverly Dr., plans by Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., 20 story Lesser Towers apartment, 691 Riolo St. $6,000,000.

▲ **Ga., Hapeville**—APARTMENT—A. D. McTindal, 649 Lakeside Dr., Hapeville, plans by L. Miles Sheffer, 422 Ponce DeLeon Ave. N. E., Atlanta, 200 apartment units, $2,000,000.

▲ **Mass., Roxbury**—SCHOOL—R. C. Archdiocese of Boston, Chancery Office, 1 Lake St., Brighton, Mass., The Madonna School for Girls, 841 Huntington Ave. $4,000,000.

▲ **Minn., St. Paul**—APARTMENT—740 River Drive, Inc., c/o B. Gingold & Assoc., archts., 841 Title Insurance Bldg., Minneapolis, 23 story, 160 unit apartment, Highland Parkway and South Mississippi River Blvd. $3,000,000. Hausner & Mascal, Architects-Engineers, Inc., S. Michigan Ave., Chicago, Ill., consult. archts. P. Rogers & Assoc., Inc., 22 W. Madison St., Chicago, Ill., structural engrs. L. D. Freedland, Metropolitan Bldg., Minneapolis, Minn., mechanical.

▲ **N. J., Clark**—HOUSES—Herbert Kligman, 936 Stuyvesant Ave., Union, 112 houses, between Skyline Dr. and Mildred Terrace. $3,500,000

▲ **N. J., New Brunswick**—OFFICE—Johnson & Johnson, 500 George Ave., plans by John MacWilliams, 495 Main St., Metuchen, 5 story office, facing Hamilton St. $3,000,000. Constr. January 1961.

▲ **N. Y., Bay Shore**—SHOPPING CENTER—Winmar Realty Dev. Co., Inc., 575 Lexington Ave., New York, N. Y., plans by Abbott-Merkt & Co., archts.-engrs., 630 Third Ave., New York, N. Y., South

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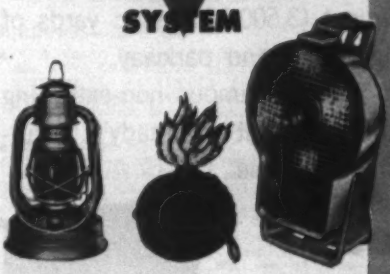

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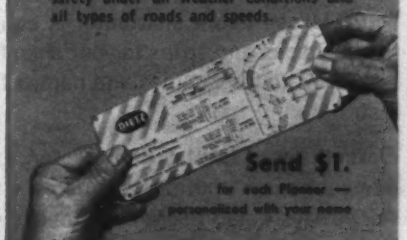

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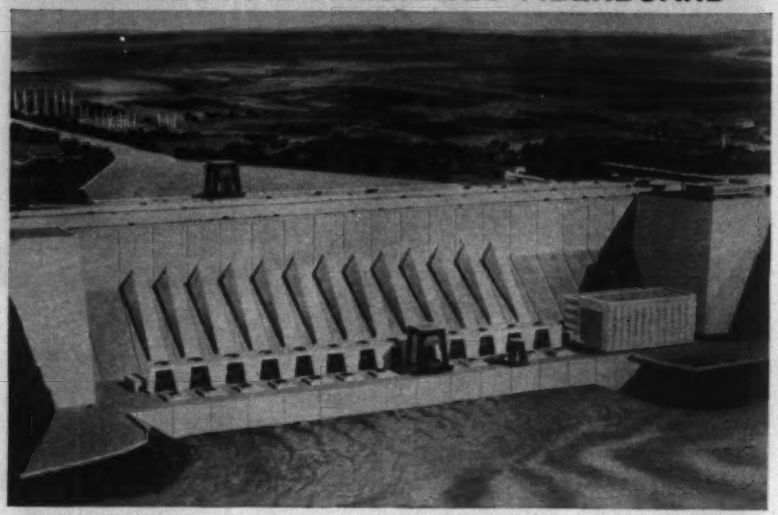

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Shore Mall shopping center, Sunrise Hy. and Brooks Ave. to incl. R. H. Macy Branch Store. $10,000,000. CD 6/9.

▲ **N. Y., New York**—MOTEL—Loew's Inc., 1540 Broadway, Zone 36, plans by Morris Lapidus, Kornblath, Harle & Liebman, 139 E. 56 St., Zone 22, 12 or 13 story, 300 room motel, west side 8 Ave. between 51 and 52 Sts. $3,500,000.

▲ **N. Y., New York**—OFFICE ALTERATIONS—Metropolitan Life Insurance Co., 1 Madison Ave., Zone 6, plans by Lloyd Morgan, 119 E. 40 St., Zone 17, office alterations. $5,000,000.

▲ **N. Y., New York**—APARTMENT—River Investing Corp., 12 E. 48 St., Zone 17, plans by Philip Birnbaum, 12 E. 48 St., Zone 17, 15 story 237x239 ft. apartment, west side of Independence Ave. between 237 and 239 Sts., Bronx Boro. $2,000,000.

▲ **N. Y., New York**—HOSPITAL ADDN.—St. Lukes Hospital, 421 W. 113 St., Zone 25, plans by York & Sawyer, 230 Park Ave., Zone 17, hospital addn. to incl. 10 story women's annex, 8 story general structure. $7,000,000.

▲ **N. Y., New York**—BOWLING CENTER—Jesse Weingart, c/o Maspeth Bowl, 5301 14 St., Elmhurst, plans by Ferrari & Tricarico, 120 W. 42 St., Zone 36, Grand Central Bow, 3 floor bowling center, Grand Central Terminal Waiting Room. $2,000,000. Joseph Bressman, 118 E. 28 St., Zone 16, N. Y., mechanical engr. Seelye, Stevenson, Value & Knecht, 101 Park Ave., Zone 17, structural engrs. (Correction—structural engrs.). CD 9/7.

▲ **N. C., Burlington**—SHOPPING CENTER—Cummings & Parke Development Corp., Box 398, Haw River, 240,000 sq. ft. shopping center, $2,500,000. Alley & Williams, 632 Chapel Hill Rd., consult engrs.

▲ **O., Marion**—HOMES, etc.—Owner, c/o Harold H. Singer, 527 W. 2nd St., Dayton, 200 homes, adjacent to Southland Shopping Center, $4,000,000; 300,000 sq. ft. Southland Shopping Center, $3,000,000.

▲ **S. C., Spartanburg**—SHOPPING CENTER—W. Clark Irwin, 399 E. Main St., shopping center, Reidsville Rd. $2,000,000.

▲ **Tex., Dallas**—MARKET CENTER—Trammell Crow, Dallas Market Center, 425 S. Field St., plans by Harold A. Berry & Harwell H. Harris, 3603 Lemmon Ave., 250,000 sq. ft. commercial bldg., (for Dallas Trade Market Center). $2,500,000. CD 9/15.

▲ **Tex., Houston**—DISCOUNT HOUSE—Tempo Co., 403 Century Bldg., 131,000 sq. ft., A/C, masonry discount house, Westheimer, near Fondren Rd. $2,250,000.

▲ **Tex., San Antonio**—OFFICE and DIAL—Southwestern Bell Telephone Co., Auditorium Circle, Div. Office, 4 story, masonry, office and dial bldg. addn., $2,200,000.

▲ **Va., Fairfax**—HOUSING—Saul Constr. Co., 1028 Connecticut Ave. N. W., Wash., D. C., plans by Jack C. Cohen, 1110 Spring St., Silver Spring, Md., 348 units garden type apartment, Route 29/211 near Fairfax Circle. $2,436,000.

INDUSTRIAL BUILDINGS

▲ **Mass., Acton**—PLANT ADDN., etc.—Air Reduction Co., 150 E. 42 St., New York, N. Y., nitrogen and argon gas plant addn. $2,000,000; distribution plant, $3,000,000.

▲ **N. J., Holmdel**—PLANT—Lily Tulip Paper Co., 122 East 42 St., New York, N. Y., plant, Rte. 34 and New York and Long Branch R.R. $10,000,000.

▲ **N. Y., Poughkeepsie**—LABORATORY—International Business Machines Corp., 590 Madison Ave., New York, Zone 22, plans by Sherwood, Mills & Smith, 65 Broad St., Stamford, Conn., 2 story, 150,000 sq. ft. product development laboratory. To go ahead in November.

▲ **Tex., Bay City**—PLANT—Celanese Chemical Co., 180 Madison Ave., New York, N. Y., petrochemical plant, Colorado River Barge Channel, near here. $7,500,000. CD 3/21.

▲ **Tex., Dallas**—PLANT-OFFICE—Taylor Publishing Co., 6320 Denton Drive, plans by George L. Dahl, consult. engr.-archt., 2101 N. St. Paul St., 250,000 sq. ft., 1 story, masonry, concrete frame plant and office, $1,750,000.

▲ **Tex., Point Comfort**—PLANT—Aluminum Co. of America, cyrtolite chemical plant addn. $1,500,000.

▲ **Tex., Texas City**—PLANT—Monsanto Chemical Co., 800 N. Lindbergh Blvd., Creve Couer 41, Mo., plant to manufacture phenol, $6,000,000. CD 7/11/57.

FOREIGN

▲ **Cambodia**—Govt. of Cambodia, Phnom-Penh, 50,000 kw. hydro-electric dam on Kampot River near Kamchay, transmission line to Phnom-Penh. $40,000,000.

▲ **Finland, Helsinki**—PLANT—Rauma-Repola Oy, Helsinki, cellulose pulp mill addn. $18,000,000. (International Finance Corp. loan—$1,875,000).

▲ **Pakistan**—West Pakistan Water & Power Development Auth., The Pipals, Lower Mall, Lahore, 2 diversions dams: Mailsi Barrage, on River Sutlej near Mailsi and Sidhnai Barrage, River Ravi near Abdul Hakim. Work will be financed by Indus Basin Development Fund. Contractors must prequalify. Information from owner. Total cost Indus Proj. $1,000,000,000. Coode & Partners, 2 Victoria St., London S. W. 1, England, consult. engrs.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 26 Maine — November 11 Vermont

STREETS AND ROADS

October 24, 31 Connecticut — October 26 Maine
October 28 November 4 Vermont — November 2 Maine

BUILDINGS—BA

Mass., Revere — HOUSING — BA 10/24 — City Housing Auth., 70 Coolidge St., Mass. 14-2 Housing Proj. $721,000. Extended date. Harold M. Turiello, 1025 Revere Beach Parkway, Revere, Mass., archt. CD 9/14.

Conn., Westport — SCHOOL — BA 10/31 — Town, Pub. Constr. Com., Town School Office, Jesup Rd.; wood, stone Hillspoint Elementary School, Hillspoint Rd. $700,000. Plans deposit $50. Victor A. Lundy, 6 E. 65 St., New York, N. Y., archt. Severud, Elstad, Krieger, 415 Lexington Ave., New York, N. Y., engrs. CD 8/1.

BUILDINGS—SLC

Mass., Lynnfield—SCHOOL, etc.—Our Lady of the Assumption Parish, Chancery Office, 1 Lake St., Brighton, soon lets contract, parochial school and convent. $700,000. Mario V. Caputo, 859 Boyiston St., Boston, archt. CD 5/10.

HEAVY CONSTRUCTION—LB & CA

CONNECTICUT—State Hy. Comr., 170 Douglas St., Hartford,

Savin Bros., Inc., 522 Cottage Grove Rd., Bloomfield, Conn., LB $913,262, (4 bidders), Projs. 63-158 & 63-163, 427 lin. ft. rein.-con., pavement, on section of east-west bound roadway on Interstate Route 84, Morgan St. Interchange incl. structures, N. E. Ramp at Morgan St. Interchange, Hartford, CONNECTICUT. Bids Oct. 10. CD 9/15.

BUILDINGS—LB & CA

▲ **Country Club Developers, Inc.**, 166 N. Main St., Andover, Mass., CA Approx. $1,250,000, Indian Ridge COUNTRY CLUB, Dascomb, Lovejoy and Blood Rds., ANDOVER, MASS. Country Club Development Corp., Indian River Country Club, Andover, Mass. Vosbeck & Ward, Alexandria, Va., archt. for Club House. Geoffrey S. Cornish, S. East St., Amherst, Mass., archt. Golf Course, United Engineers, Inc., 150 Causeway St., Boston, Mass., engrs. CD 6/20.

▲ **C. M. Bacon & Sons**, Forest Hill Rd., Dunstable, Mass., LB $1,126,539, Base Bid, Alt. 1 subtract $95,000, Proj. M-729, Contr. 7, renovate Cushing HOSPITAL, FRAMINGHAM, MASS. Commonwealth of Mass., Dpt. Mental Health, Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Oct. 7. CD 9/13.

▲ **Tocci Bros. Constr. Co., Inc.**, 38 Colonial Ave., Newtonville, Mass., CA $2,525,128, HIGH SCHOOL, Bolton St., MARLBORO, MASS. City, City Hall, Marlboro, Mass. Bids Sept. 21, awarded Oct. 10. CD 9/27, under LB.

Oneglia & Gervasini, Inc., Casson Ave., Torrington, Conn., LB $860,000, (9 bidders), ELEMENTARY SCHOOL, Stafford Ave., Stevens St. Area, BRISTOL, CONN., Town, Bd. Educ., 212 Louisiana Ave., Bristol, Conn. CD 9/8.

▲† **Paul Tishman Co., Inc.**, 21 E. 70 St., New York, N. Y. LB $6,273,987, (18 bidders), 7 story POST OFFICE and COURTHOUSE, HARTFORD, CONN., General Services Admin., 19 and F Sts. N. W., Wash., D. C. Bids Oct. 11. CD 10/5.

▲ **Litchfield County Homes, Inc.**, 187 Church St., Torrington, Conn., Owner Builds, Total cost $4,141,850, 2 year program, 1st year $3,000,000, 343 HOUSES, Fieldcrest Estates, Cowhill Rd., etc., MYSTIC, CONN.

Vuono-Linde Constr. Co., 217 Bedford St., Stamford, Conn., CA $950,000, 2 story, 100,000 sq. ft., brick MFG. PLANT, Route 7, WILTON, CONN. Perkin-Elmer Corp., Main Ave., Norwalk, Conn. Bids Sept. 30, awarded Oct. 6. CD 10/6, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 28 Pennsylvania — November 1 Maryland

STREETS AND ROADS

October 25 Maryland — October 26, November 3 New Jersey
October 28 Pennsylvania

▲ **Pa., Media**—BA 10/27—Comrs. Delaware Co., Court House, Refuse Incinerator Plant No. 3, Broomall, $2,000,000. Plans deposit $60. Damon & Foster, Chester Pike and High St., Sharon Hill, engrs. CD 8/29.

BUILDINGS—BA

▲ **N. J., Englewood Cliffs**—HEADQUARTERS—BA 10/25—Volkswagen Corp. of America, 340 Sylvan Ave., headquarters, Rte. 9W. $2,400,000. Fellgraff Ballou & Daly, 577 Teaneck Rd., Ridgefield Park, archts. CD 10/27/59.

N. Y., Patchogue—SCHOOL—BA 10/26—Bd. Educ. UFSD 24, Sacton St., Barton Ave., elementary school. $960,000. Plans deposit $50 general, $25 mechanical trades. Frederic P. Wiedersum Assoc., 65 Roosevelt Ave., Valley Stream, N. Y., archts. CD 6/20, under N. Y., Brookhaven.

▲ **Pa., Kennett Square**—RECEPTION CENTER, etc.—BA 10/31—Longwood Gardens, Kennett Square, reception center and parking area. $1,000,000. Walter Dorwin Teague, 415 Madison Ave., New York, N. Y., archt. Fred S. Dubin Assocs., 635 Farmington Ave., Hartford, Conn., engrs. CD 4/28.

▲ **N. Y., New York**—SCHOOL—BA 11/3—Deputy Supt. of Schools, Bureau Constr., 4 Floor, 42-15 Crescent St., Long Island City, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures at P. S. 154, Alexander Ave. between E. 136 St. and Major Deegan Blvd., Bronx Boro. Plans deposit $25 general, $10. mechanical trades. (Correction—bid date). CD 8/11.

▲ **N. Y., New York**—NURSES RESIDENCE, etc.—BA 11/10—Dpt. P. Wks., Municipal Bldg., Rm. 2200, Zone 7, general contract, plumbing work, heating and ventilating and electrical work nurses residence and school, Bronx Municipal Hospital Center, Bronx Boro. Plans deposit $80. CD 6/8/59.

▲† **N. J., Fort Dix**—HOUSING—BA 11/15—U. S. Eng., 111 E. 16 St., New York 3, N. Y., 200 units Capehart Housing, Proj. 2, ENG-30-075-61-30. $2,000,000. CD 10/5 under LB.

▲ **N. Y., Rochester**—UNDERGROUND GARAGE—BA 11/18—City, City Hall, Rm. 36, 20 South Fitzhugh St., Zone 14, Stage II. Midtown Plaza underground garage. $3,000,000-$4,000,000. Plans deposit $100. Bohackt & Flynn, 311 Alexander St., Rochester, N. Y. and Victor Gruen Assocs., 2 W. 13 St., New York, N. Y., archts.

BUILDINGS—SLC

▲ **D. C., Wash.**—OFFICE, etc.—International Bank of Washington, 1625 Eye St. N. W., soon lets contract foundation work for 12 story office and garage at 1701 Pennsylvania Ave., N. W., total est. $5,000,000. Vlastimil Koubek, 810 18th St. N. W., archt. CD 8/29.

HEAVY CONSTRUCTION—LB & CA

PENNSYLVANIA — State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Edward A. Taylor Co., Inc., Box 551, Coatesville, Pa., CA $744,554, cr. agg. base hy. with bituminous surface variable in width; widening, 20,962 ft. T.R. 145, Lehigh Twp., Wainutport Boro, Northampton Co. Bids Sept. 16, awarded Oct. 7. CD 9/21.

BUILDINGS—LB & CA

▲ **V. B. Constr. Co., Inc.**, 157 Sunnyfield St., Scarsdale, N. Y., CA $1,005,950, two 3 story, 44x225 ft. DORMITORIES and KITCHEN and DINING HALL addns., BROOKVILLE, N. Y. Long Island University, C. W. Post College, Northern Blvd., Brookville, N. Y. Bids Sept. 29, awarded Oct. 7. CD 10/6, under LB.

▲ **Hofstra College**, 1000 Fulton Ave., Hempstead, N. Y., rejected bids Sept. 28, 3 story, bsmnt., 40,000 sq. ft. ADMINISTRATION BLDG. and parking area, HEMPSTEAD, N. Y. LB $820,000. Will re-advertise. CD 10/3, under LB.

▲ **John T. Brady & Co., Inc.**, 606 W. 47 St., New York 36, N. Y., LB $5,542,000, (7 bidders), general contract WORKHOUSE, Rikers Island, Bronx Boro, NEW YORK, N. Y. Dpt. P. Wks., Rm. 2200, Municipal Bldg., New York 7, N. Y. Bids Sept. 28. CD 8/23;

The Rosenman Corp., 280 Broadway, New York 7, N. Y., LB $1,034,000, (6 bidders), plumbing, Workhouse, Rikers Island, Bronx Boro (New York, N. Y.);

AFGO Engineering, 475 Adelphi St., Brooklyn 38, N. Y., LB $725,770, (3 bidders), heating and ventilating, Workhouse, Rikers Island, Bronx Boro (New York, N. Y.);

John G. Heilman Co., Inc., 507 E. 76 St., New York 21, N. Y., LB $824,000, (10 bidders), electrical work, Workhouse, Rikers Island, Bronx Boro (New York, N. Y.).

Godfrey M. Weinstein & Co., 295 Madison Ave., New York 17, N. Y., Owner Builds, $800,000, 19 story COOPERATIVE APARTMENT, northwest corner East 69 St. and 3 Ave., NEW YORK, N. Y. Paul Resnick & Harry Green, 654 Madison Ave., New York 21, N. Y., archts. CD 9/18/59.

▲ **General Vacuum Corp.**, 400 Border St., East Boston 28, Mass., CA VACUUM FACILITY incl. FURNACE for high temperature processing of space age materials, SCHENECTADY, N. Y. General Electric Co., River Rd., Schenectady 5, N. Y. CD 8/18.

▲ **Gumina Bldg. & Constr. Co.**, foot of Talmadge St., New Brunswick, N. J., CA $1,065,872, JUNIOR HIGH SCHOOL, EDISON, N. J. Bd. Educ., S. Colton Rd., Edison, N. J. Bids Aug. 16. CD 7/15.

B. J. Lucarelli & Co., 11 McCarter Hy., Newark, N. J., CA $822,812, NURSES HOME, ELIZABETH, N. J. Bd. Trustees St. Elizabeth's Hospital, 204 S. Broad St., Elizabeth, N. J. Bids May 25. CD 7/14, under LB.

▲ **Segal Constr. Co.**, 185 Valley St., South Orange, N. J., Owner Builds, $2,000,000, 85 HOUSES, Charles Lane, EAST HANOVER, N. J. Herman York, 90-04 161 St., Jamaica, N. Y., archt.

▲ **Collins Park**, Rte. 38, Moorestown, N. J., Owner Builds, $4,128,000, RESIDENTIAL DEVELOPMENT (129), Rte. 38, MOORESTOWN, N. J. Frank Hall, Haddon Heights, N. J., archt.-engr.

Albert Wassberg, Inc., 41 W. Quackenbush Ave., Dumont, N. J., Owner Builds, $900,000, 30 HOUSES, west side, Paramus Rd., PARAMUS, N. J. Harsen & Johns, 60 Westervelt Ave., Tenafly, N. J., archts.

Cedar Wood Gardens, 19-13 Fairlawn Ave., Fairlawn, N. J., Owner Builds, $750,000, 30 HOUSES between Rte. 07 and Paramus Rd., PARAMUS, N. J. Harsen & Johns, 60 Westervelt Ave., Tenafly, N. J., archts. CD 11/11.

Fred Brotherton, 185 Atlantic Ave., Hackensack, N. J., LB $732,200, EMPLOYEES' BLDG., Bergen Pines Hospital, PARAMUS, N. J. Bd. Freeholders, Administration Bldg., Hackensack, N. J. Robert Cadien, 570 George Rd., Cliffside Park, N. J., archt.

▲ **Wark & Co.**, 1920 Sansom St., Phila., Pa., CA Approx. $2,000,000, 50,000 sq. ft. PLANT, Hy. 130, PENNSAUKEN, N. J. Standard Brands, Inc., 625 Madison Ave., New York, N. Y. Bids Sept. 21. CD 9/15.

Ansil Corp., c/o Ann Silverman, Midstream Rd., Point Pleasant, N. J., Separate Contracts, $860,000, 86 RESIDENTIAL DEVELOPMENTS, Coolidge Dr., POINT PLEASANT, N. J.

Old Brook Homes, 706 Turnpike Rd., South River, N. J., Owner Builds, $900,000, 65 addnl. HOMES adjoining present development, Kamm Ave., SOUTH RIVER, N. J. H. Thomas Carr, 313 State St. Perth Amboy, N. J., engr.

▲ **Bender Homes, Inc.**, 1817 S. 4th St., Phila., Pa., Separate Contracts, $1,439,100, RESIDENTIAL DEVELOPMENT (90), Lincoln Hy., etc., BENSALEM, PA.

▲ **Fanelli Brothers**, 522 Kelly Lane, Glenside, Pa., Separate Contracts, $1,720,000, RESIDENTIAL DEVELOPMENT (54), Rte. 23, Schuylkill Twp., CHESTER SQUARE, PA.

▲ **Fort Washington Industrial Park Constr. Co.**, Fort Washington, Pa., CA $1,500,000, 150,000 sq. ft. DISTRIBUTION CENTER, FORT WASHINGTON, PA. Phila. Wholesale Drug Co., 10th and Garden Sts., Phila., Pa. Edward Founce, Fort Washington, Pa., engr. Ernest Trimboth, Fort Washington, Pa., archt. CD 10/6.

▲ **Frank H. Wilson Co.**, 125 Coulter Ave., Ardmore, Pa., CA $3,992,800, general contract JUNIOR-SENIOR HIGH SCHOOL, Bustleton Pike, etc., PHILA., PA. Phila. Bd. Educ., 21st and Parkway, Phila., Pa. Martin Stewart & Noble, 117 S. 17th St., Phila., Pa., archts. Allabach & Renis, 16 S. Broad St., Phila., Pa., engrs. CD 10/6.

Parkman Homes, Inc., M. Leibowitz, Lewis Tower Bldg., Phila., Pa., Separate Contracts, $735,000, RESIDENTIAL DEVELOPMENT (42), Tabor Rd., etc., PHILA., PA.

▲ **Jewel Homes**, 3497 E. Livingston, Columbus, O., Own Forces, $5,600,000, 350 HOMES, Heritage Hills subdivision, PITTSBURGH, PA.

Wenwood Builders, Inc., Box 172, Abington, Pa., Separate Contracts, $700,000, RESIDENTIAL DEVELOPMENT (52), ROSLYN, PA.

Carl Gennsen & Son, 6210 Belair Rd., Baltimore 6, Md., CA $795,000, 1 and 2 story, brick, concrete, steel, etc., George Fox JUNIOR HIGH SCHOOL, Greenhaven, ANNAPOLIS, MD. Bd. Educ. Anne Arundel Co., Green St., Annapolis, Md. Bids Sept. 28. CD 10/6, under LB.

▲ **George A. Fuller Constr. Co.**, Munsey Bldg., Wash., D. C., CA Est. $1,000,000, NEW WING, Hall of Life Sciences, WASH., D. C. National Academy of Sciences, 2101 Connecticut Ave. N.W., Wash., D. C. Harrison & Abramowitz, 630 Fifth Ave., New York, N. Y., archts. CD 5/11/59.

▲ **Abe Pollin**, 6101 - 16th St. N.W., Wash., D. C., Owner Builds, $2,000,000, 10 story, 152 units, masonry APARTMENT, 1425 N Street N.W., WASH., D. C. Berla & Abel, 2000 P St. N.W., Wash., D. C., archts.

▲ **Volpe Constr. Co.**, 261 Constitution Ave. N.W., Wash., D. C., CA $1,723,000, St. Ann's INFANT HOME, Eastern Ave., near 16th St. N.E., WASH., D. C. Archdiocese of Washington, 1721 Rhode Island Ave. N.W., Wash., D. C. Philip Schreier, 1420 K St. N.W., Wash., D. C., archt. CD 10/4, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 25 West Virginia — October 26 Louisiana
November 4 Kentucky & Indiana — November 23 Virginia

STREETS AND ROADS

October 25 West Virginia — October 26 Louisiana
November 4 Kentucky — November 10 Ohio

BUILDINGS—BA

▲ **Ky., Owensboro** — OFFICE — BA 10/28 — Texas Gas Transmission Co., 3 and Locust Sts., (selected list bidders), 4 story, 150,000 sq. ft. office. $3,500,000. Skidmore Owings & Merrill, 425 Park Ave., New York, N. Y., archts. Syska & Hennessy, 144 E. 39 St., New York, N. Y., mechanical engrs. Welskopf & Pickworth, 2 W. 45 St., New York, N. Y., structural engrs. CD 8/4.

▲† **Ky., Fort Knox**—HOUSING—BA 11/29—U. S. Eng., P.O. Box 59, Louisville, Zone 1, 350 unit Capehart

Addition to Diamond's Department Store, Park Central Shopping Center, Phoenix, Arizona. Associated General Contractors: Bell Vista Properties and E.F. Hargett & Co. Planners: John Graham, Architects and Engineers. Supervising Architect: John Schotanus

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2. For extra-smooth finished columns, use Seamless SONOTUBE Fibre Forms.
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4. For encasing existing posts, piles, utility lines, etc.,with concrete, use SONOTUBE Encasement Forms.
5. For columns to be formed in water or excessive dampness, use Special SONOTUBE Fibre Forms.

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Housing, ENG-15-029-61-11. $5,500,000. Plans deposit $10. CD 8/18, under LB.

BUILDINGS—SLC

▲ Fla., Plantation — SHOPPING CENTER — Plantation Plaza Shopping Center, 5209 W. Broward Blvd., soon lets contract shopping center. $1,000,000.

HEAVY CONSTRUCTION—LB & CA

▲ VIRGINIA—Dpt. Hys., 1221 E. Broad St., Richmond, Va.—Barnhill Contg. Co., Tarboro, N. C., CA $1,113,732, (10 bidders), 1.343 mi. grading, and drainage. Rte. 95 Proj. 0095-029-102, C501, Fairfax Co., CD 10/10, under LB.

Va.—Benny Snyder, White Sulphur Springs, W. Va. CA $1,518,147, (10 bidders), 4.281 mi. grading and drainage on Rte. 95. Proj. 0095-076-010-G301, 0095-089-101, G304, Prince William & Stafford Counties.

Va.—Richard F. Kline, Inc., Frederick, Md. CA $1,256,586, (9 bidders), 1.531 mi. 9 in. rein.-con. pave. on Rte. 413. Proj. 0413-029-007, C508. Fairfax Co.;

Va.—English Constr. Co., Inc., Altavista, Va. CA $901,451, (12 bidders), 7.347 mi. 5½ in. b. conc. pave and bridge on Rte. 304. Fairfax Co. Grand total $4,789,916.

Appalachian Power Co., 1st and Franklin, Roanoke, Va. Own Forces, $700,000, Martinsville Substation for Du-Pont plant; conversion of Fieldale-Morris and Hoehler Fieldale lines, Martinsville, Henry Co. VIRGINIA. CD 9/16.

▲ WEST VIRGINIA—State Rd. Comn., Charleston, Zone 5, Bids opened 10/11,

W. Va.—Boso & Ritchie, Inc., Ravenswood, W. Va., LB $864,815, (12 bidders), grading, draining, structures, four lane divided, 2.193 mi. Interstate Rte. 64 from Mud River to Sec. Rte. 60/29, Proj. I 64-1 (35)19, Cabell Co.;

W. Va.—Earp & Armstrong, Parsons, W. Va., LB $214,145, (10 bidders), grading, draining, traf. bd. base, road mix surf. 7.432 mi. Brandywine Sugar Creek Rd., Sec. Rte. 21, Proj. N AD 2 (1), Contract No. 3, Pendleton Co. CD 9/28.

▲ NORTH CAROLINA—State Hy. Comn., Capitol Bldg., Raleigh,

Blythe Bros., Co., 2911 Hutchinson Ave., Charlotte, N. C. CA $2,643,761, concrete paving Interstate Rte. 40, Proj. 8.18527, McDowell Co. Bids Sept. 27, awarded Oct. 11. CD 9/30, under LB.

▲ NORTH CAROLINA—State Hy. Comn., State Hy. Bldg., Raleigh,

Brown Paving Co., Box 484, Lexington, N. C. and Wilson Constr. Co., Inc., Box 603, S. Main St., Salisbury, N. C. CA $2,182,792, grading, CABC, b. conc. binder surf., concrete pavement, structures 6.92 mi. Interstate Rte. 85 from point east of East End of Salisbury By-Pass to point west of Lexington By-Pass Proj. 8.15257, I 85-3(14)83, Davidson Co. Bids July 26, awarded Oct. 11. CD 7/28, under LB.

▲ McLean Contg. Co., 2405 Kimball Terrace, Norfolk, Va., CA Est. $1,800,000, railroad bridge renovations MACKEYS, N. C. Norfolk-Southern Railway Co., 402 Terminal Station, Norfolk, Va.

SOUTH CAROLINA—State Hy. Dpt., Hotel Wade Hampton, Columbia,

Blythe Brothers Co., 2911 Hutchinson Ave., P. O. Box 989, Charlotte 1, N. C., CA $746,954, Alternate 2, rubble masonry gutter, grading, drainage, earth surf 4 lane hy., 3.722 mi. Inter, 85, Rte. 24 to Rd. S-71, S. C. Docket 4.503, FAP I-85-1 (4), Anderson Co., CD 7/27. under LB.

Curry Builders, King St. Exten., Charleston, S. C. LB $869,000, Waterfront cold storage facility, CHARLESTON, S. C. S. C. State Ports Auth., 1 Vendue Range, Charleston, S. C. CD 9/12.

† Robert E. Lee, Reynolds & Smith, Box 428, Moore Haven, Fla., LB $959,383, est. $885,592, constructing Levees 50 and 61, CIVENG-08-123-61-15, Central & Southern, FLORIDA. U. S. Eng., P.O. Box 4970, Jacksonville. CD 9/21.

▲† Williams McWilliams, Inc., Box 584, New Orleans, La., CA $1,391,799, removal and satisfactory disposal by hydraulic dredge 11,357,000 cu. yd. material, Mississippi River Gulf Outlet Channel, St. Bernard Parish, CIVENG-16-047-61-29, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Oct. 4. CD 10/10, under LB.

McDonough Constr. Co. of Louisiana, Inc. Box 19327, New Orleans, La., LB $987,730, (5 bidders) elevator house transfer, car unloader and dock collection facilities, PORT ALLEN, LA. Greater Baton Rouge Port Comn., Port Allen, La. Barnard & Burk, 1023 Nicholson Dr., Baton Rouge, La., engrs.

BUILDINGS—LB & CA

▲ Michnick Brothers, 7165 Gallows Rd., Annandale, Va., Owner Builds, $7,000,000, 400 HOUSES, Mount Vernon Valley, ANNANDALE, VA.

▲ Reinsch Constr. Corp., 2024 Columbia Pike, Arlington, Va. CA Over $1,000,000, second phase 126 unit Westmont, APARTMENTS, ARLINGTON, VA. Chas. & Louis E. Luria, 2024 Columbia Pike, Arlington, Va.

Eugene Hooper, 411 Shady Lane, Falls Church, Va. CA $934,765 Walt Whitman INTERMEDIATE SCHOOL, Ft. Hunt Rd., FAIRFAX, VA. Fairfax County Bd. Educ., Fairfax, Va. Strang & Childers, 725 Maple St., Annadale, Va., archt. CD 4/25.

Steven Lee Corp., c/o Stancill & Arthur, Realtors, 718 Church St., Lynchburg, Va., Owner Builds, $900,000, Greenbriar APARTMENTS, Rivernont Ave., LYNCHBURG, VA. CD 6/6.

▲ **W. L. Hughes Constr. Co.**, 742 E. 25th, Norfolk, Va., CA Est. $1,000,000, cooperative APARTMENTS, NORFOLK, VA. Jefferson Arms Corp., 742 E. 25th, Norfolk, Va. CD 4/13/54.

▲ **W. S. Carnes**, 1512 E. Belt Blvd., Richmond, Va. Owner Builds, Est. $2,500,000 SHOPPING CENTER, Cobgill and Hopkins Rds., RICHMOND, VA. CD 8/17.

▲ **Daniel Constr. Co.**, 429 N. Main St., Greenville, S. C., CA Over $1,000,000, Azalea Plaza SHOPPING CENTER, WILMINGTON, N. C. Hargrove Bellamy 1417 Market St., Wilmington, N. C. Leslie N. Boney, 120 S. 5th St., Wilmington, N. C., archt.

Barge & Co., 250 Piedmont Ave. N.E., Atlanta, Ga., CA $912,300, OFFICE, ATLANTA, GA. Mara-Conner, Inc., 739 W. Peachtree St. N.W., Atlanta, Ga. Fireman's Fund Insurance Co., lessee. Bids Sept. 20. CD 10/7, under LB.

▲ **Holloway & Miller, Inc.**, 1411 Venetian Dr., S. W., Atlanta, Ga., Owner Builds, $5,000,000, 339 RESIDENCES, Western Estates subdivision, ATLANTA, GA.

Beech Builders, Inc., 305 Empire Bldgs., Columbus, Ga., Owner Builds, $800,000, 75 RESIDENCES, Rosewood Subdivision, COLUMBUS, GA.

▲ **Marquesee Associates of Florida, Inc.**, 1941 N. Federal Hy., Boca Raton, Fla., Owner Builds, $2,000,000, 152 RESIDENCES, BOCA RATON, FLA.

▲ **J. Hilbert Sapp**, P.O. Box 2053, Orlando, Fla., CA $2,127,300, Deland SENIOR HIGH SCHOOL, Deland JUNIOR HIGH SCHOOL and DeWitt Taylor JUNIOR-SENIOR HIGH SCHOOL, DELAND, FLA. Volusia Co. Bd. Public Instruction, 230 N. Stone Ave., Deland, Fla. CD 10/4, under LB.

Tom P. Ollinger, 314 Dalewood Dr., Mobile, Ala., CA Est $900,000, St. Mary's HOME FOR GIRLS, Moffett Rd., MOBILE, ALA. St. Mary's Home, 404 Government St., Mobile, Ala. John J. Carey, First National Bank Annex, Mobile, Ala., archt. Bids Sept. 20, awarded Oct. 7, CD 10/5, under LB.

▲ **Haury & Smith**, 2017 Belmont Blvd., Nashville, Tenn., Owner Builds, $1,500,000, 86 RESIDENCES, NASHVILLE, TENN.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 25 Illinois
November 1 Indiana
November 10 Ohio

STREETS AND ROADS

October 25 Illinois
November 1 Indiana
November 10 Ohio

BUILDINGS—BA

▲ **Ind., Gary**—SCHOOL—BA 10/25—School City of Gary, 620 E. 10th Pl. Div. A, 45,000 sq. ft. Kuny Elementary School, 50th and Georgia Sts., $486,000; 1 and 2 story, Brunswick Elementary School, 7th and Gerry Sts. $810,000. Beine Hall & Curran, 607 Broadway, archts. CD 9/23.

Wis., Port Washington—SCHOOL—BA 11/10—Bd. Educ., 1 story, 162x347 ft. elementary school. $830,000. Plans deposit $50. Schutte, Phillips, Mochon, 1121 W. Oklahoma Ave., Milwaukee, archts. CD 7/18.

HEAVY CONSTRUCTION—LB & CA

George Bahre Co., 150 E. 38th St., Indianapolis, Ind., CA general contract, 3 story mausoleum addn. steel, Indiana limestone, marble, rein.-con. crypts, north of present structure, INDIANAPOLIS, IND. Grown Hill Cemetery, Clarendon and 38th St., Indianapolis, Ind. Total est. $800,000. CD 7/12/44;
T. W. Woelfing Co., 121 N.E., Indianapolis, Ind., mechanical contract, 3 story mausoleum addn. (Indianapolis, Ind.);
B. & G. Electric Co., 578 N. Alville Ave., Indianapolis, Ind., electric contract, 3 story mausoleum addn. (Indianapolis, Ind.).

▲ **Mayfair Constr. Co.**, 5660 N. Jersey Ave., Chicago, Ill. CA $4,840,600, No. 80.85-60-116, Transworld Airlines Hangar, Contract RB 19, Chicago-O'Hare International Airport, Park Ridge, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. Bids Aug. 19. CD 8/26, under LB.

▲ **WISCONSIN**—State Hy Comm., State Office Bldg., Madison,
Wis.—Edward Kraemer & Sons, Inc., Plain, Wis. CA $387,275, Structures B-53-65, B-53-66 and approaches, 0.36 mi. Contract 1, Madison-Janesville Rd. (USH 14 interchange) Proj. I 90-3(35)171, Rock Co.;
Wis.—Mil-Wis Constr. Co., 4295 N. 127th St., Brookfield, Wis., CA $797,833, Structure B-40-78 and approaches Contract 1, North-South Expressway (Green Bay Ave. underpass) Proj. U 077-1(17) Milwaukee Co.;
Wis.—Concrete Constr. Inc., 10815 Watertown Plank Rd., Wauwatosa 13, Wis., CA $100,766, Structure B 40-134, Contract 1, West Expressway (Swan Blvd., Underpass) Proj. T 03-1(34), Milwaukee Co.;
Wis.—R. C. Hinman, Glenwood City, Wis., CA $95,259, Structures B 10-16, B 10-17 and B 10-18, Contract 2, Owen-Abbotsford Rd., Proj. F 020-1(24) Clark Co.;
Wis.—LaCrosse Dredging Corp., 140 S. Dearborn St., Chicago 3, Ill., CA $581,072, Structure B 40-106 Contract 1, East-West Expressway (lane interchange C. & N.W. Ry. underpass) Proj. IG 94-4(49)302, Milwaukee Co. Grand total $1,962,205. Bids Oct. 4, awarded Oct. 5. CD 9/13.

Bruckner Boulevard Expressway, Bronx, New York, N.Y. Contractor: Tully & DiNapoli. Engineer: City of New York.

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▲† **Great Lakes Dredge & Dock Co.**, Williamson Bldg., Cleveland, O., CA $4,396,294, dredging Saginaw River from D & M R. R. Bridge to 24 ft contour in Saginaw Bay, downstream from Bay City, CIVENG-20-064-61-5, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit 26, Mich. Bids Sept. 23. CD 9/27, under LB.

BUILDINGS—LB & CA

▲ **Joseph Drobny Constr. Co.** c/o Bond Realty Co., 37 E. Market St., Akron, O., Owner Builds, $2,000,000 150 HOMES, Park Heights, Estates, off N. Hawkins Ave., AKRON, O.

Baker & Combs, Inc., 475 Ackermann St., Columbus, O., CA $930,700, SPACE ARTS BLDG., Ohio University, ATHENS, O. Dpt. P. Wks. State Depts. Bldg., Columbus, 15,O. Bids Sept. 7. CD 9/23, under LB.

▲ **Leonard Krill Constr. Co.**, 2169 E. 33rd St., Cleveland, O., CA Est. $1,000,000, (6 bidders), 75,000 sq. ft. PLANT, Miles Rd. east of Richmond Rd., BEDFORD HEIGHTS, O. World Publishing Co., 2231 W. 110th St., Cleveland 11, O. Austin Co., 16112 Euclid Ave., Cleveland 12, O., archts. CD 4/6, under O., Cleveland, as project location.

▲ **Eisenman-Elliot**, 37 N. Sylvan Ave., Columbus, O., CA general contract third GENERATING UNIT at CONESVILLE GENERATING STATION near Coshocton, CONESVILLE, O. Columbus & Southern Ohio Electric Co., 215 N. Front St., Columbus, O. Total est. $20,000,000;
Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh, Pa., CA, generating unit, Conesville generating station, (Conesville, O.);
Riley Stoker Corp., 99 Neponset St., Worcester, Mass. CA, pulverized-fuel unit, Conesville generating station, (Conesville, O.);

▲ **Leviton Constr. Co.**, Keith Bldg., Dayton, O., CA Est. $1,000,000 (5 bidders), 100 unit Howard Johnson MOTOR COURT, north of DAYTON, O. Alfred I. Soltz, Leader Bldg., Cleveland 14, O. CD 4/27.

▲ **MacDonald Engineering Co.**, 22 W. Madison St., Chicago, Ill., CA lime and cement PLANT to house three new-type rotary kilns, refractory burning equipment, machinery for processing dolomite WOODVILLE, O. Standard Lime & Cement Co., Woodville O., div. American-Marietta Co., 101 E. Ontario St., Chicago, Ill.

▲ **Miller-Davis Co.**, 1029 Portage St., Kalamazoo, Mich. CA $1,049,514, Plum Landing APARTMENTS, AURORA, ILL. The Mighell Fund, Inc., 495 N. Lake St., Aurora, Ill. Bids June 3. CD 6/23, under LB.

Chell & Anderson, 5425 N. Kedzie Ave., Chicago, Ill., LB $717,100, (5 bidders), general contract, ELEMENTARY SCHOOL, Wilcox and Kostner Aves., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Oct. 3. CD 7/26.

Coath & Goss, Inc., 5103 W. Lake St., Chicago 44, Ill. CA $812,029, COLLEGE addn., CHICAGO, ILL. Moody Bible Institute, 820 N. LaSalle St., Chicago 10, Ill. Bids Sept. 20. CD 10/7, under LB.

Mercury Builders, Inc., 761 S. Harlem Ave., Forest Park, Ill., CA $809,471, Schiller SCHOOL, Scott and Vine Sts., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Sept. 19, awarded Oct. 5. CD 9/28, under LB.

▲ **Gust K. Newberg Constr. Co.**, 2040 N. Ashland St., Chicago, Ill., LB $17,483,000, Proj. 2-37, Stage 3, 1,262 unit Robert R. Taylor HOUSING PROJ., COMMUNITY CENTER, CENTRAL HEATING PLANT, MAINTENANCE BLDG., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago 5, Ill. Bids Oct. 11. CD 10/7.

▲ **F. R. Orr Constr. Co.**, 4414 Vine St., Denver, Colo., CA $2,000,000, 200,000 sq. ft. HOSE MFG. PLANT, GALESBURG, ILL. Gates Rubber Co., 999 S. Broadway Ave., Denver, Colo. Bids Sept. 26. CD 9/7.

▲ **T. S. Willis Constr. Co.**, 202 Milwaukee St., Janesville, Wis., CA $1,000,000, 12 story APARTMENT, ROCK ISLAND, ILL. Steepmeaders Apartments, 21st Ave. at 12th St., Rock Island, Ill.

Selmar Co., 128 N. Pearl St., Green Bay, Wis., CA $705,800, University of Wisconsin EXTENSION CENTER, GREEN BAY, WIS. Brown Co. Court House, Green Bay, Wis. Bids Sept. 16. CD 10/7, under LB.

▲ **Hutter Constr. Co.**, 134 Western Ave., Fond du Lac, Wis., LB $1,358,760, (2 bidders), CORRECTIONAL INSTITUTION. Kettle Moraine PLYMOUTH, WIS. State Dpt. Pub. Welfare, Madison, Wis. Bids Sept. 22. CD 8/16.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
November 9, 10 Texas

STREETS AND ROADS
October 25 Colorado
November 3 Kansas
October 28 New Mexico
November 9, 10 Texas

▲† **Texas-Louisiana**—BA 11/3—U. S. Eng., P. O. Box 1229, Galveston, Tex., dredging Sabine-Neches waterway, Sabine-Neches canal, realignment of Sabine River Channel and Orange Turning Basin, Orange and Jefferson Counties, Texas, and Cameron and Calcasieu Parishes, Louisiana, 7,586,000 cu. yds., CIVENG-41-253-61-8, $1,500,000. CD 10/6.

† **N. M., Roswell**—MISSILE ASSEMBLY and MAINTENANCE SHOP, etc.—BA About 11/22—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., missile assembly and maintenance shop and technical supply bldg., Walker Air Force Base, ENG-29-005-61-16. Approx. $800,000. Plans deposit $10. CD 1/29.

▲† **Tex., Wichita Falls**—HOSPITAL—BA 11/23—U. S. Eng., 100 West Vickery, Fort Worth, 300/300 bed hospital and facilities, Sheppard Air Force Base, Inv. No. ENG-41-443-61-18. Roscoe De Witt, 2025 Cedar Spring Rd., Dallas, archts. CD 10/7.

BUILDINGS—BA

Mo., Montgomery City—SCHOOL—BA 10/25—Montgomery County School Dist. R-II, Junior-Senior High School. $780,000. Plans deposit $50. Dan R. Sanford & Sons, 800 Westport Rd., Kansas City, Mo., archts. CD 4/5.

▲ **Missouri**—HOTEL, etc.—BA 11/4—State Park Bd., Jefferson Bldg., 100 E. Capitol Ave., Jefferson City, lease 50 acre tract in Table Rock State Park, Stone Co. and construct hotel, lodge, swimming pool, etc. Initial development to cost more than $1,000,000. CD 7/28, under LB.

▲ **Colo., Aurora**—JUNIOR HIGH SCHOOL—BA 11/7—School Dist. No. 28-J. Adams and Arapahoe Counties, 1085 Peoria, Aurora, 1 story, 87,258 sq. ft., South Junior High School, $1,300,000. Atchison, Kloverstrom, Saul & Atchison, 257 Josephine, Denver, archts. CD 9/7.

HEAVY CONSTRUCTION—LB & CA

Industrial Constr. Co., 9216 Grand Ave., Minneapolis, Minn., CA $769,955, Hy. separation CSAH 62 over Valley View Rd., grade, storm sewers, grav. base, road mixed and plant bit. surf. and 3 bridges, MINNEAPOLIS, MINN. Hennepin Co., Minneapolis, Minn. Bids Oct. 4. CD 10/11, under LB.

▲ **Utilities Engineering & Constr. Co.**, 2800 N. Sante Fe St., P.O. Box 3231, Oklahoma City 5, Okla., LB $1,006,653, WW Contract B-4, earthwork, building, clearwell, year piping, underfloor piping, OTTUMWA, IOWA. Ottumwa Water Works & Hydro-Electric Plant, 310 S. Wapello St., Ottumwa, Iowa. Bids Sept. 14. CD 8/22.
Fowler Plumbing & Heating Co., 217 E. 2nd St., Centralia, Ill., LB $243,560, WW Contract B-1 electrical equipment (Ottumwa, Iowa).
Roberts Filter Mfg. Co., Darby, Pa., LB $290,989, WW Contract B-2, interior plant piping, plumbing, equipment, installing equipment (Ottumwa, Iowa).
Blake Plumbing & Heating Co., P.O. Box 226, Agency, Iowa, LB $109,400, WW Contract B-3, equipment, piping, controls for heating, ventilating and air conditioning (Ottumwa, Iowa).

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Mo.—**Koss Constr. Co.**, 510 Iowa Des Moines Bank Bldg., Des Moines, Iowa and **W. J. Menfee Constr. Co.**, 2500 W. 16 St., P. O. Box 30, Sedalia, Mo., CA $2,366,637, graded earth, culverts, 2-24 ft. concrete pavts., 4.949 mi., Greene Co.;
Mo.—**W. J. Menefee Constr. Co.**, 2500 W. 16 St., P. O. Box 30, Sedalia, Mo., CA $507,320, graded earth, culverts, 1-24 ft. conc. pavt. 1.316 mi., Lafayette Co.;
Mo.—**Koss Constr. Co.**, 510 Iowa Des Moines Bank Bldg., Des Moines, Iowa, CA $1,785,557, graded earth, culverts, 2-24 ft. conc. pavts. 15.132 mi., Stoddard Co.; CA $521,098, graded earth, culverts, 2-24 ft. conc. pavts. 2.053 mi., Stoddard Co.; CA $290,955, graded earth, culverts, 2-24 ft. conc. pavts. 0.568 mi., Stoddard Co. Grand total $5,471,567. Bids Sept. 30, awarded Oct. 4. CD 10/10, under LB.

▲ **Danco Constr. Co.**, 1300 East Thirteenth St., North Little Rock, Ark., CA $1,325,000, 76 mi. underground telephone cable from Pine Bluff to Montrose, 14 amplifier stations, ARKANSAS. Southwestern Bell Telephone Co., 900 West Capitol Ave., Little Rock, Ark. CD 8/23, under CA.

Ozark Rural Electric Corp., Fayetteville, Ark., Owner Builds, $975,000, rural electric distribution lines and short extension in Washington Co. and vicinity, ARKANSAS. CD 10/1/52.

▲† **Commonwealth Electric Co.**, 1901 Y St., Lincoln, Neb., CA $1,001,450, Missouri River Basin Proj., stringing conductors and overhead ground wires for 99 mi. Bismarck-Jamestown 230 kv Transmission Line No. 2, Burleigh, Kidder and Stutsman Counties, Spec. DC 5380, NORTH DAKOTA. Bureau Reclamation, Dpt. Interior, Fargo, N. D. Bids Sept. 15, awarded Sept. 30. CD 9/20, under LB.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol 5, Oklahoma City,
Okla.—**Worth Constr. Co.**, 300 Greenleaf Ave., Fort Worth, Tex., CA $1,223,855, c. conc. pavement for 4-lane I 35 north and west of Perry Noble Co.;
Okla.—**Broce Constr. Co.**, Woodward, Okla., CA $983,651, sand asph. base, b. conc. surf. 5.81 mi. on 4 lane I 40 west of Canadian-Caddo County Line, Caddo Co. Bids Sept. 23. Awarded Oct. 4. CD 9/27, under LB.

▲† **Austin Bridge Co.**, Box 1590, Dallas, Tex., CA $1,815,967, spillway at Navarro Mills Dam and Reservoir, near Corsicana, TEXAS. U. S. Eng., 100 W. Vickery Bldg., Fort Worth, Tex. CD 10/12, under LB.

† **Ward Constr. Co.**, Rte. 10, Box 2179, San Antonio, Tex., CA $852,962, 9 mi. levees, 3.8 mi. canal between Mission and Ponitas, Inv. AN-6358, TEXAS. International Boundary & Water Comn., Mart Blvd., El Paso, Tex. CD 9/29.

Colorado Constructors & Northwestern Eng. Co., 725 W. 39th Ave., Denver, Colo., LB $748,991, est. $525,891, (5 bidders), intake tower, line and yard piping for Micro Strainer Plant, DENVER, COLO. Denver Bd. Water Comrs., 144 West Colfax, Denver, Colo. R. B. McRae, c/o owner, ch. engr. Bids Oct. 5. CD 9/27.

BUILDINGS—LB & CA

Heymann Constr. Co., 1201 South State St., New Ulm, Minn., LB $750,575, (8 bidders), ELEMENTARY SCHOOL, NEW ULM, MINN. Bd. Educ. Independent School Dist. No. 83, New Ulm, Minn. Bids Oct. 4. CD 9/22.

G. I. Johnson & Son Co., 848 W. 79 St., Minneapolis, Minn., LB $873,419, (8 bidders), 4 story Central HIGH SCHOOL addn., alterations, RED WING, MINN. Bd. Educ. Independent School Dist. No. 256, Red Wing, Minn. Bids Oct. 4. CD 9/13.

D. L. Witcher, Inc., 400 2 Ave. S., Minneapolis, Minn., CA $997,585, SENIOR HIGH SCHOOL, WAYZATA, MINN. Bd. Educ. Independent School Dist. No. 284, Wayzata, Minn. Bids Sept. 22. CD 9/28, under LB.

▲ **Robert M. Berkeley, Berkeley Constr. Co.**, 8015 Forsyth Blvd., Clayton 5, Mo., Owner Builds, Total cost $1,500,000 (3-4 Year Program) First Year $500,000, 93 brick, veneer, concrete, etc. RESIDENCES, Hickory Hills Subdivision, DES PERES, (ST. LOUIS 31 P. O.) MO.

▲ **The Bentley Development Co.**, 8008 Carondelet Ave., Clayton 5, Mo., Owner Builds, Total cost $2,500,000 (3 Year Program) First Year $980,000, 360 addnl. frame RESIDENCES, Cedar Brook Subdivision vicinity Lindbergh Blvd. and Missouri Bottom Rd., FLORISSANT, MO.

▲ **Bell & Sons**, Romaine Creek Rd. off Hy. 141, Hillsboro, Mo., Owner Builds, Total cost $1,500,000 (3 Year Program) First Year $500,000, 193 RESIDENCES, Arrowhead Hills Subdivision, HILLSBORO, MO.

▲ **Horton Stubblefield**, Fenton Rural Rte. 1, Murphy, Mo., Owner Builds, Total cost $1,500,000 (3 Year Program) First Year $500,000, 210 RESIDENCES, Crystal Hills Subdivision, Hunning Rd. Mile Southeast of Hy. No. 30, MURPHY (VALLEY PARK P.O.), MO.

M. H. Glick Developers, Inc., 9630 Olive Street Rd., Olivette 32, Mo., Owner Builds, Total cost $900,000 (2-3 year program), 94 RESIDENCES, Section 4, Indian Meadows Subdivision adjacent to 9500 Olive Street Rd., OLIVETTE (ST. LOUIS 32 P.O.), MO.

Papin Builders, c/o 8922 Manchester Rd., St. Louis 17, Mo., Owner Builds, Total cost $800,000 (2 Year Program) First Year $500,000, 49 brick or brick and frame RESIDENCES, Barrington Estate Subdivision adjacent to Dowerhill Dr. and Crestwick Dr., SAPPINGTON (ST. LOUIS 28, P. O.), MO.

H. W. Schulenberg Co., 7925 Clayton Rd., Richmond Heights 17, Mo., Owner Builds, Total Cost $950,000 (2-3 Year Program) First Year $500,000, 52 brick RESIDENCES, Buxton Terrace Subdivision on Garber Lane, Eddie and Parke Rds., SAPPINGTON (ST. LOUIS 26, P. O.), MO.

▲† **Brezina Constr. Co.**, 709 Steel St., Box 1592, Rapid City, S. D., CA $3,134,050, 190 units Capehart HOUSING, Ellsworth Air Force Base, RAPID CITY, S. D. Base Procurement Office, Ellsworth Air Force Base, Rapid City, S. D. Bids Aug. 11, awarded Oct. 7. CD 8/22, under LB.

▲ **Park Manor Development Co.**, c/o Ervine E. Peterson, 2263 Y St., Lincoln, Neb., Owner Builds, $4,155,000, 277 RESIDENCES, dam and spillway, Wedgewood Manor Subdivision, LINCOLN, NEB.

▲ **Strauss Bros.**, 3815 Touzalin Ave., Lincoln, Neb., Owner Builds, $1,000,000 APARTMENT COURT, incl. five 2 and 3 story bldgs., carports, and parking areas, Cotner Blvd. and Vine St., LINCOLN, NEB.

P. G. Bell & Co., P. O. Box 13196, Houston, Tex., CA $745,000, CO-EDUCATIONAL HIGH SCHOOL, BEAUMONT, TEX. Catholic Diocese of Galveston, 1411 Sealy St., Galveston, Tex. CD 7/19.

▲ **Austin Co.**, 16112 Euclid Ave., Cleveland, O., CA $1,000,000, POWER PLANT, BLACKWELL, TEX. West Texas Utilities Co., 1062 N. 3 St., Abilene, Tex. CD 4/27/59;
National Valve & Mfg. Co., Pittsburgh, Pa., CA $452,880, power plant piping (Blackwell, Tex.).

▲ **Chapman-Dalton Constr. Co.**, Oates Dr., Dallas, Tex., CA $3,900,000, 300 DWELLINGS, Valwood Park, FARMERS BRANCH, (Br. Dallas), TEX. C. & D. Development Co., Oates Dr., Dallas, Tex.

Linbeck Constr. Co., 2720 Saint St., Houston, Tex., CA $907,000, DEPARTMENT STORE, HOUSTON, TEX. Foley's Div. of Federated Dpt. Stores, 1110 Main St., Houston, Tex. CD 3/16/59.

▲ **Southwestern Constr. Co.**, P.O. Box 1204, Houston, Tex., CA $4,303,000, (7 bidders), Jewish MEDICAL RESEARCH CENTER, HOUSTON, TEX. Baylor University College of Medicine, 1200 M. D. Anderson Blvd., Houston, Tex. CD 8/2.

(Continued on page 100)

HAROLD PATE

WITH POWER SHIFT TRANSMISSION...

"We proved the 977H Traxcavator doubles our production"

Strunk Bros. of Tiskilwa, Ill., put its new Caterpillar 977H to the test.

"We put the Series H machine against the earlier 977 . . . had them side by side excavating and loading 10-yard trucks," Superintendent Harold Pate reports. "Both machines had expert operators. The 977H loaded out five trucks in the same time the older machine got 2 or 2½ trucks. We proved the new 977H Traxcavator doubles our production."

Operator Wilbur Crank, who loaded 11 to 12 cu. yd. of clay and loam in the trucks in 60 seconds with the new unit, explains why.

"It's easier to operate. It's got more power. It's faster and handles well in mud. But most important, it's got that power shift transmission. That's the biggest part of the faster cycles. I can shift down instantly—and I mean *instantly*—to the speed I need. A flick of the wrist and I'm in second for moving. Another flick and I'm in reverse."

The 977H is a machine with more of everything. Horsepower of its turbocharged engine is up 50%—to 150 HP at the flywheel. Hydraulic lifting power is up 41% because of Caterpillar's *live action* hydraulics. That means faster lifting speed and greater lifting capacity without robbing power from the tracks.

Bucket capacity is up 11%—to 2½ cu. yd.—and there's a stronger linkage to handle the heavier loads. And there's a larger, stronger, lifetime lubricated undercarriage to stand up under the roughest conditions. It never needs servicing until rebuilding.

You may be missing a lot—in profits and production—if you aren't using one of the new Series H Traxcavators. See for yourself. Your Caterpillar Dealer will demonstrate one of the new machines side by side with the machine you are now using on your present job. And watch the difference!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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TRAXCAVATORS ARE MAKING OTHER LOADERS OBSOLETE

(Continued from page 98)

Odessa Natural Gasoline Co. & Warren Petroleum Co., Odessa, Tex., Owners Build, Est. $750,000 GASOLINE PLANT, near MIDLAND, TEX. CD 8/16.

▲ **R. T. Bickhard Constr. Co.,** Box 97, Highland Station, Denver, Colo., LB $1,812,056, est. $1,500,000, (4 bidders), 15 story, two bsmnts., 104 units, Glen Ayre Towers APARTMENT, E. 8th Ave. and Clarkson Streets, swimming pool and underground parking, DENVER, COLO. Ledgerwood Realty & Investment Co., 701 Colorado Blvd., Denver, Colo. Bids Oct. 6. CD 9/20.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 17 California
STREETS AND ROADS
October 28 Arizona November 1, 7 Utah
November 9, 10 California

Calif., San Leandro—MARINA—BA 11/3—City, City Hall, Phase I, marina development, dredging 700,000 cu. yd. fill, 2½ mi. channel leading into 200 ft. wide marina. $500,000. (Total cost project $1,200,000). Plans deposit $10. Indenco Engineers, Inc., 2960 Merced Ave., San Leandro, Calif., engr. CD 5/12.

▲† **Washington**—BA 11/8—U. S. Eng., City-County Airport, Walla Walla, embankment protection for NP Ry. along Snake River in conjunction with Ice Harbor Dam Reservoir, CIVENG-45-164-61-2, $2,000,000. Plans deposit $3.80. Extended date. CD 9/21.

▲† **California**—BA 11/22—Bureau Reclamation, Dpt. Interior, Lewiston, furnishing, installing, testing two 55,555 kva, 90% power factor, 13,800 volt, 200 rpm, 60 cycle, vertical shaft, alternating current generators for Trinity Power Plant, Trinity River Division, Central Valley Proj., near Lewiston, Inv. No. DS 5422. CD 9/15/59.

BUILDINGS—BA

▲ **Utah, Salt Lake City**—Visitors', CENTER—BA 11/4—Church of Jesus Christ of Latter Day Saints, 47 E. South Temple, Salt Lake City, Zone 1 (selected list bidders), 3 story, 22,000 sq. ft. visitors' center. $1,500,000. George Cannon Young, 610 Utah Savings & Trust Bldg., Salt Lake City, Zone 1, archt. CD 7/6.

▲ **Calif., Sacramento**—GYMNASIUM, etc.—BA 11/22 State Div. Architecture, 1120 N St., Sacramento, 45,530 sq. ft. women's gymnasium, two outdoor swimming pools, handball court, Sacramento State College, W. O. 4304GC-7 and 4304GC-28. $1,191,200. Plans deposit $75. CD 8/7/59.

▲ **Calif., San Diego**—LIFE SCIENCE and PSYCHOLOGY BLDG.—BA 11/30—State Div. Architecture, 1120 S. Grand Ave., Los Angeles, 4 story, bsmnt., 138,000 sq. ft. life science and psychology bldg. addn. San Diego State College, W. O. 4304GC-44. $3,000,000. Plans deposit $200. CD 5/6.

HEAVY CONSTRUCTION—LB & CA

ALASKA—State Dpt. P. Wks., Juneau, Bids opened 10/3,

Wright-Truck & Tractor Service, Inc., Box 221, Fairbanks, Alaska, LB $731,745, est. $716,035 (10 bidders), grading, draining 12.97 mi. roadway, redecking 300 and 350 ft steel trusses with treated timber and 3 treated timber approaches on Sterling Hy., Soldotna to Kasilof. Proj. F-021-1(9). CD 9/16.

UTAH—State Rd. Comn., State Capitol, Salt Lake City, Zone 14, Bids opened 10/11.

Strong Co., Springville, Utah, LB $949,768, (10 bidders), 6.196 mi. gravel surf. road and 2 concrete and 2 steel bridges, 1 mi. south of St. George to Arizona Line, Washington Co. CD 9/22.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Gibbons & Reed Co., 825 West 9 North St., Salt Lake City, Utah, CA $2,448,169, grading, surf. 6.9 mi. four lane freeway US Hy. 80 between 1.1 mi. west of Grays Wells and ½ mi. west of Ogilby Rd. about 27 mi. east of Holtville, Imperial Co. Bids Sept. 15. CD 9/20, under LB.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Gallagher & Burk, Inc., 344 High St., Oakland 1, Calif., CA $773,111, grading, surf. 2 mi. two and four lane hy. and constr. of two bridges on Taylor Blvd. between Pleasant Hill Rd. and State Sign Rte. 21, Contra Costa Co. Bids Sept. 14, awarded Oct. 7. CD 9/21, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles. Bids opened 10/6,

Webb & White, 512 South San Vicente Blvd., Los Angeles, Calif., LB $2,189,778 (5 bidders), grading, paving 0.8 mi. 8 lane freeway on Glendale Freeway between 0.2 mi. southwest of Glendale Blvd. and Riverside Dr., incl. structures, Los Angeles Co. CD 9/8.

▲† **W. M. Lyles Co.,** P.O. Box 495, Avenal, Calif., LB $2,552,735, aircraft fuel pipe line from Estero Bay to Naval Air Station, NBy 29252, LEMOORE, CALIF. Dist. P. Wks. Office, 12th Naval Dist., San Bruno, Calif. Bids Oct. 5. CD 9/13.

▲† **D. Gerald Bing,** P.O. Box 237, Adelanto, Calif., CA $1,465,000, taxiway and airfield pavements, Naval Air Station, NBy 29255, Spec. 29255/60, LEMOORE, CALIF. Dist. P. Wks. Office, 12th Naval Dist., San Bruno, Calif. Bids Sept. 21. CD 8/30.

Pacific Allied, 7605 Wheatland Ave., Sun Valley, Calif., CA $809,445, Proj. 174, Scott Rd. Storm Drain, Burbank, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Sept. 16, awarded Oct. 6. CD 9/22, under LB.

Norco Constr. Co., 21123 S. Norwalk Blvd., Artesia, Calif., CA $771,677, Carbon Creek Channel, Part 2, SANTA ANA, CALIF. Orange County Flood Control Dist., Court House, Santa Ana, Calif. Bids Sept. 28, awarded Oct. 4. CD 10/3, under LB.

BUILDINGS—LB & CA

▲ **Lanai Corp.,** 875 S. Redwood Rd., Salt Lake City 4, Utah, Owner Builds, Total cost $3,000,000, (2 year program), First Year, $1,000,000, 102 APARTMENT UNITS, SALT LAKE CITY, UTAH. Ralph Edwards, 782 E. 21 St., Salt Lake City 15, Utah, archt.

H. S. Wright Constr. Co., 414 Pontius St., Seattle, Wash. CA Est. $700,000, 3 story, 90x315 ft., rein.-con. PAPER MILL addn., BELLINGHAM, WASH. Pacific Coast Paper Mills, Chestnut and Laurel Sts., Bellingham, Wash. CD 10/13.

▲ **Hoffman Constr. Co.,** 715 SW Columbia St., Portland, Ore. CA $2,103,560, (10 bidders), CEMENT TERMINAL, incl. six 40 ft. dia. concrete silos, 123 ft. high, eight bulk loading bins, SEATTLE, WASH. Ideal Cement Co., Denver National Bldg., Denver, Colo. Bids Oct. 5. CD 9/7.

Southco Co., 745 First St., Encinitas, Calif., CA $806,872, 72 RESIDENCES, GARAGES, Poinsettia Heights No. 4, ENCINITAS, CALIF. Northco Land Co., 745 First St., Encinitas, Calif. CD 7/26, under LB.

S. & S Constr. Co., 8857 W. Olympic Blvd., Beverly Hills, Calif., CA $957,520, 75 stucco DWELLINGS, Tract 3809, GARDEN GROVE, CALIF. Meadowcrest Corp., 8857 W. Olympic Blvd., Beverly Hills, Calif.

▲ **Rexford Constr. Co.,** 8240 Santa Monica Blvd., Los Angeles, Calif., CA $2,707,874, Santiago HIGH SCHOOL, GARDEN GROVE, CALIF. Garden Grove High School Dist., 11271 Sanford St., Garden Grove, Calif. James H. Van Dyke, 3912 Oakwood Ave., Los Angeles, Calif., archt. Bids Sept. 26, awarded Oct. 6. CD 10/3, under LB.

Calbro, Inc., 6855 Rosecrans Ave., Paramount, Calif., Owner Builds, $753,700, 78 DWELLINGS, Tract 24952, LA MIRADA, CALIF.

Coastate-Beswick, Inc., 2750 E. Spring St., Long Beach, Calif., CA $737,892, est. $600,000, (15 bidders), UNIVERSITY POLICE STATION, 1546 Santa Barbara Ave., LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Oct. 5, awarded Oct. 7. CD 9/14.

W. J. Nicholson Co., Inc., 805 Kifer Rd., Santa Clara, Calif., CA $891,888, 63,700 sq. ft. wood, steel frame, metal and redwood siding Raymond J. Fisher INTERMEDIATE SCHOOL, Roberts and Rose Sts. LOS GATOS, CALIF. Los Gatos Union Elementary School Dist., P. O. Box 515, Los Gatos, Calif. Bids Sept. 20. CD 9/28, under LB.

MacLeod Constr. Co., 1538 San Nicholas St., Ventura, Calif., CA $795,800, (8 bidders), Fremont SCHOOL, OXNARD, CALIF. Oxnard Elementary School Dist., 255 Palm Dr., Oxnard, Calif. Bids Oct. 4, awarded Oct. 4. CD 9/12.

▲ **Robert McKee,** 4701 West San Fernando Rd., Los Angeles, Calif., LB $8,336,000, (7 bidders), County GENERAL HOSPITAL, SAN DIEGO, CALIF. San Diego County, Rm. 306, Civic Center, San Diego 1, Calif. Bids Oct. 11. CD 8/9.

▲ **James E. Roberts Co.,** 984 41 St., Oakland, Calif., LB $3,692,500, 310 Hayes Valley APARTMENT UNITS and 18 addnl. Sunnydale APARTMENT UNITS, SAN FRANCISCO, CALIF. San Francisco Housing Auth., 440 Turk St. San Francisco, Calif. CD 11/8/57.

Triangle Subdivision, 13535 Ventura Blvd., Van Nuys, Calif., Owner Builds, $700,000, stucco APARTMENT, 4419 Fulton Ave., VAN NUYS, CALIF. Albert A. Erkle & Assoc., 3515 Cahuenga Blvd., Los Angeles, Calif., engrs.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
October 26, November 2, 19 Ontario
STREETS AND ROADS
October 26, November 2, 3, 9 Ontario

Ont., Windsor—BA 10/31—City, City Hall, relief sewer, incl. approx. 6,500 lin. ft. 9 ft. monolithic sewer, 14,400 lin. ft. 18- to 72-in. sewer Church St. $800,000. Plans deposit $50. Gore & Storrie Ltd., 1130 Bay St., Toronto, engrs. CD 4/29.

HEAVY CONSTRUCTION—LB & CA

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

A. B. Grimwood Ltd., 1129 Kingsway, Vancouver, B. C., LB $771,838, (7 bidders), Proj. 347, Vancouver-Fraser River Section Trans-Canada Hy., Dewdney Electoral Dist.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Downsview,

Simkins Constr. Co. Ltd., Andrews and Jarvis Sts., Winnipeg, Man., CA $1,061,053, grading, culverts, granular base 11.08 mi. Trans-Canada Hy. 17 from 19 mi. east of Longbow Corners, easterly (Contract 60-162), Longbow Corners. Bids Sept. 21. CD 8/23.

▲ **Dravo of Canada Ltd.,** 159 Bay St., Toronto, Ont., LB $1,533,000, (9 bidders), pile foundations for Elevator No. 4, Montreal Harbor, MONTREAL, QUE. National Harbors Bd., Hunter Bldg., Ottawa, Ont.

Omega Constr. Co. Ltd., 6555 Cote de Neiges Rd., Montreal, Que., CA $960,875, recreation center, Marquette Park, Marquette and Bellechasse Sts., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Sept. 14. CD 9/22, under LB.

BUILDINGS—LB & CA

Wilchar Constr. Ltd., Box 220, Dundas, Ont., LB $1,025,000, (14 bidders), 1 and 2 story, approx. 273x236 ft. structural steel, masonry HOME for AGED, DUNDAS, ONT. Wentworth County Home for the Aged, South St., Dundas, Ont. Prack & Prack, 310 Main St. E., Hamilton, Ont., archts.

▲ **W. H. Cooper Constr. Co., Ltd.,** 21 Hunter St. E., Hamilton, Ont., CA $1,845,700, Westmount Secondary SCHOOL, HAMILTON, ONT. Bd. Educ., 357 Hunter St. W., Hamilton, Ont. CD 9/21, under LB.

▲ **H. M. Brooks Ltd.,** 240 Rolson St., Oshawa, Ont., CA $1,009,354, (7 bidders), 6 story, rein.-con., frame, steel HOSPITAL addn., OSHAWA, ONT. Oshawa General Hospital Bd., 24 Alma St., Oshawa, Ont. Bids Sept. 6. CD 8/30.

▲ **Campeau Constr. Co., Ltd.,** 969 Bronson Ave., Ottawa, Ont., Owner Builds, $1,000,000, 1 and 2 story, TERRACE HOUSING PROJ., Queensway Terrace N. OTTAWA, ONT. Bemi, Murray & Assocs., 969 Bronson Ave., Toronto, Ont. archts. CD 7/25.

▲ **Thomas Fuller Constr. Co., (1958) Ltd.,** 199 Richmond Rd., Ottawa, Ont., CA Est. $1,000,000, STUDIO BLDGS, television station, City View, OTTAWA, ONT. Ernest Bushnell Broadcasting Assocs., Ltd., 130 Slater St., Ottawa, Ont. CD 7/25.

▲ **Carter Constr. Co., Ltd.,** 419 Cherry St., Toronto, Ont., CA $2,215,229, 700 ft. long, concrete GRAIN ELEVATOR, 120 ft. high, waterfront, PORT ARTHUR, ONT. United Grain Growers Ltd., Hamilton Bldg., 395 Main St., Winnipeg, Man. Bids July 6. CD 6/27.

▲ **Defense Constr. (1951) Ltd.,** 56 Lyon St., Ottawa, Ont. cancelled bids to have been opened Sept. 27, 2 story, partially precast exposed aggreg. concrete panels, brick panels, structural steel armouries bldg., TORONTO, ONT. $1,000,000. Page & Steele, 72 St. Clair Ave. W., Toronto, Ont., archts. C. D. Carruthers & Wallace, Consultants Ltd., 92 Yorkville Ave., Toronto, Ont., engrs. CD 9/2.

Heights Developments Ltd., c/o 1245 Martingrove Rd., Rexdale, Ont., Owner Builds, $800,000, two APARTMENTS, Don Mills Rd. near Greenbelt Dr., TORONTO, ONT. Venchiarutti & Venchiarutti, 194 Wilson Ave., Toronto, Ont., archts.

▲ **W. B. Sullivan Constr. Co., Ltd.,** P.O. Box 40, O'Connor Postal Station, Toronto 16, Ont., LB $1,113,000, (9 bidders), 4 story, 40x200 ft. structural steel Scarborough MUNICIPAL BLDG. addn., TORONTO, ONT. Twps. Scarborough, 2001 Eglinton Ave. E., Toronto, Ont. Bids Sept. 21. CD 8/31.

▲ **Tuxford Constr. Ltd.,** 121 Richmond St. W., Toronto, Ont., CA $1,235,949, nine low rent HOUSES, Halden Ave., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont., and Welfare & Housing Dpt., 350 Christie St., Toronto, Ont. CD 9/15, under LB.

▲ **York Mills Investments, Ltd.,** 1016 Eglinton Ave. W., Toronto, Ont., Owner Builds, $1,500,000, three 6 story, masonry APARTMENTS, TORONTO, ONT. George Jarosz, 1949 Eglinton Ave. W., Toronto, Ont., archt.

▲ **Robertson-Yates Corp., Ltd.,** Box 301, Hamilton, Ont., CA $2,461,586, 1, 2 and 3 story, 130,000 sq. ft. concrete slab on grade, rein.-con. structural steel in heavy LABORATORY WING, ENGINEERING BLDG., air-conditioned, WATERLOO, ONT. The University of Waterloo, Dearborn Ave. W., Waterloo, Ont. Bids Sept. 20. CD 8/25.

▲ **J. G. Fitzpatrick Ltd.,** 5151 Western Ave., Montreal, Que., LB $1,653,145, (12 bidders), 4 story, structural steel, brick, precast concrete SCIENCE BLDG., AUDITORIUM, LIBRARY, MONTREAL, QUE. Loyola College, 7174 Sherbrooke St. W., Montreal, Que. Bids Sept. 27. CD 9/8.

PUERTO RICO

BUILDINGS—LB & CA

▲ **Rexach Constr. Co.,** Box 8175, Santurce, Puerto Rico, CA Est. $1,200,000, 7 story, 58,511 sq. ft. 132-room HOTEL PIERRE, SAN JUAN, PUERTO RICO. Swiss Chalet Inc., De Diego Ave., San Juan, Puerto Rico. O'Kelley, Mendez & Brunner, 1004 Labra, San Juan, Puerto Rico, archts. CD 1/21.

FOREIGN

BUILDINGS—LB & CA

▲ **Solel Boneh Constr. and Public Works Co.,** Tel Aviv, CA $1,000,000, 20,000 sq. ft. BASILICA of Annunciation, NAZARETH, ISRAEL. Franciscan Order, Nazareth, Israel. Giovanni Muzio, Milan, Italy, archt. I. M. Levkovitz, Tel Aviv, superv. archt.

▲ **Rassco Co.,** Tel Aviv, Israel CA Est. $12,000,000, 30 story OFFICE, UNDERGROUND GARAGE, TEL AVIV, ISRAEL. Herzlia Circle Co., c/o Mayer Investment Corp., Ahad Haam St. No. 28, Tel Aviv, Israel. Isaac Perlstein, Tel Aviv, Israel, archt.

(Proposal Advertisements see pp. 114 to 116)

Another Example of Prescon's Advantages...

Savings and Long, Clear Spans Gained in School Construction

Robstown High School, Robstown, Texas
Architect and Engineers: Donnelly & Whittet, Corpus Christi

The Gym for Robstown High School has 117 ft. span (outside to outside of column) using The Prescon System to post-tension the prestressed concrete three hinged arch. Savings over conventional methods approached five figures. T. Y. Lin observed that this is one of the most outstanding structures in the country. Of the other buildings, four made use of The Prescon System in a cast in place beam and slab structural system.

Savings, design flexibility, and materials that are readily available are possible when you plan with prestressed concrete using The Prescon System of post-tensioning. For details of this and other types of structures write or contact a Prescon representative.

CURRENT OR RECENTLY COMPLETED JOBS:

Pier 40 Superstructure, New York City • Titan Missile Silos, South Dakota • Belcher 13 Story Apartment Building, San Francisco • Beverly Hills Parking Structure, Hollywood • Highway Bridges, California • Memorial Stadium, Charlotte, N. C.

See our catalog in Sweet's.

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No matter what your scraper requirements may be — small yardage work for land conservation, secondary roads etc. to the biggest projects — the Euclid TS-14 can cut your earthmoving costs.

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If you want a one-man earthmoving spread that can work more days per year . . . that handles a wider range of jobs and isn't stalled by steep grades and adverse conditions . . . ask your dealer for the new catalog No. 555 or better yet, have him show you one in operation.

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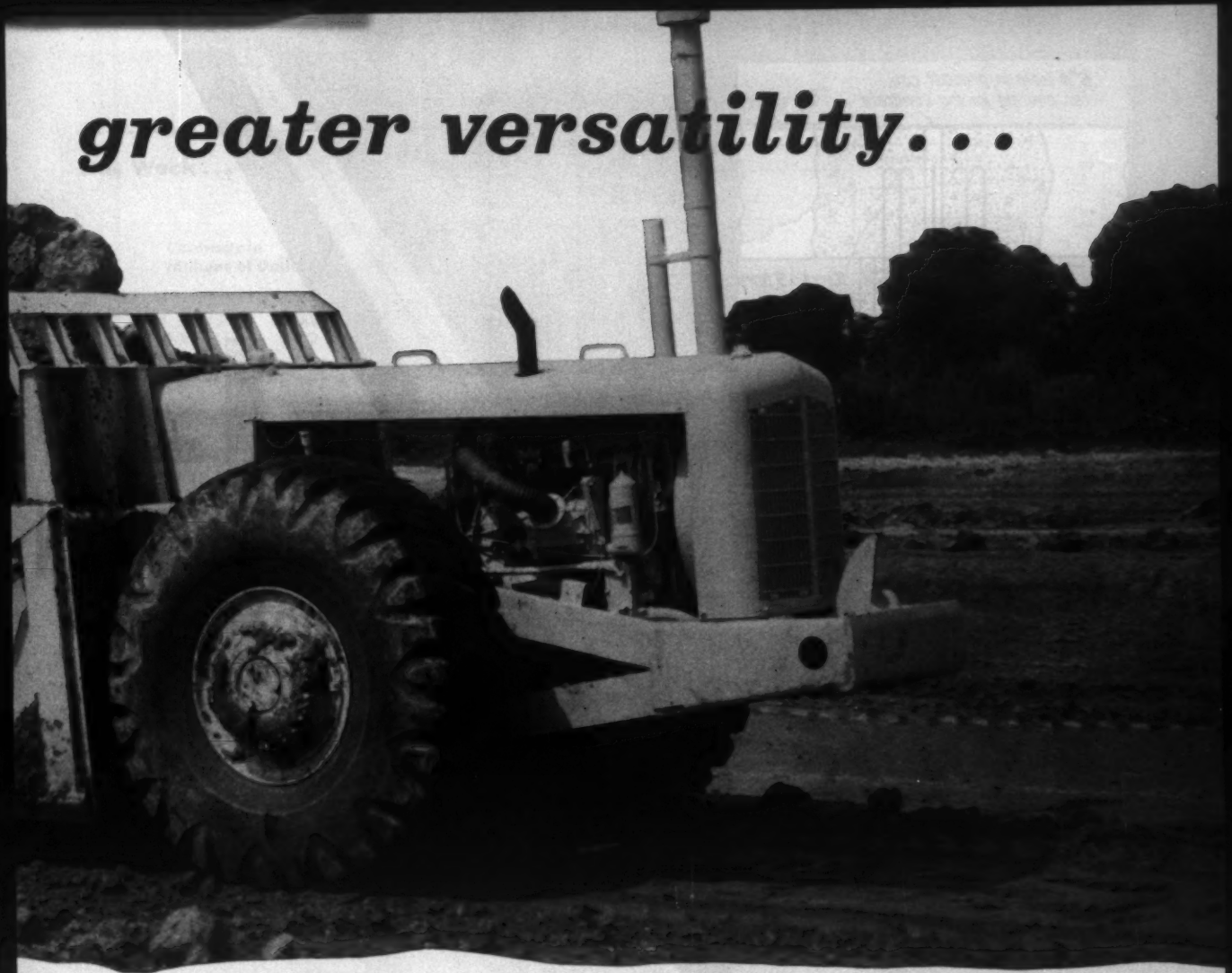

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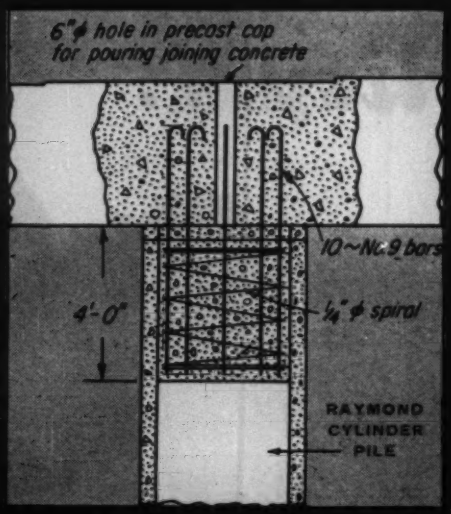
FOR MOVING EARTH, ROCK, COAL AND ORE



PONTCHARTRAIN TO PENSACOLA:

RAYMOND and the case of the traveling bridge

From an assembly line two hundred miles away, thousands of Raymond prestressed concrete cylinder piles were floated to the site of the new $8,000,000 Pensacola Bay Bridge.

Because of tricky bottom conditions many of the 54-inch Raymond piles—enough to support about 3,000 feet of the bridge—were built to a length of 164 feet, quite probably the longest ever used for a bridge in this country. The precast, prestressed deck slabs reach a span of 60 feet and weigh about 156 tons apiece, providing twin roadways, each 26 feet wide.

Much time, meaning much money, was saved by using these post-tensioned Raymond piles, even though they had to be barged for 200 miles from the yard in Mandeville, La. Incidentally, this yard was set up originally to fabricate the same type of Raymond pile for the magnificent Lake Pontchartrain Causeway.

It is this quality, derived from long experience and creative engineering ability, that Raymond offers as stock-in-trade. Foundations often present unusual problems and we are equipped to handle most of them, however large or small, on land or under water. May we be of help to you? Just call or drop a line to any of the Raymond offices here or abroad.

DESIGN AND SUPERVISION: Engineering Staff, Florida State Road Dept.
CONTRACTORS: a joint venture of Brown & Root and T. L. James, Inc.

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RAYMOND
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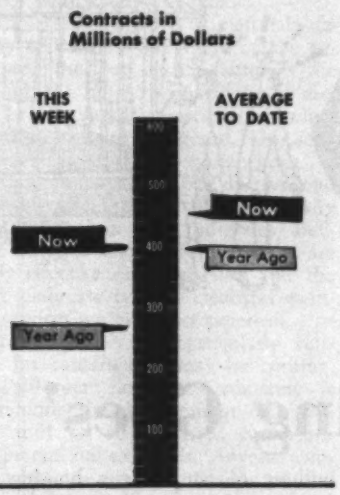
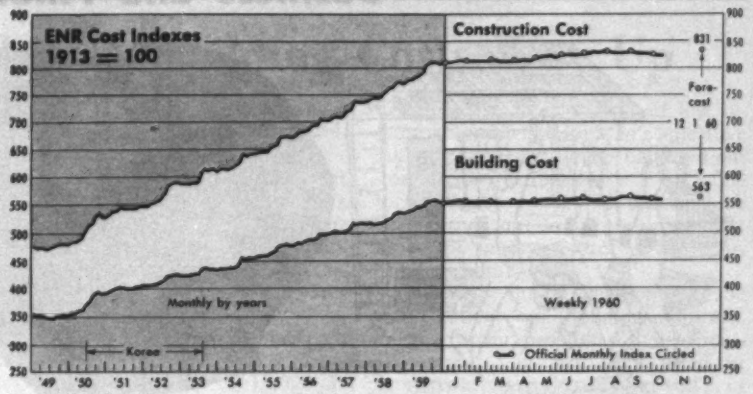
FOUNDATIONS AND SPECIALIZED CONSTRUCTION IN AMERICA...COMPLETE CONSTRUCTION SERVICES ABROAD

Construction Scoreboard

This Week...





ENR INDEXES (1913=100), 20 cities' average	Week of Oct. 13 1960	% Change from Sept. 15 1960	% Change from Oct. 15 1959
Construction Cost	829.25	−0.1	+2.3
Building Cost	561.12	−0.2	+1.1

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

AMOUNT OF CONTRACTS LET

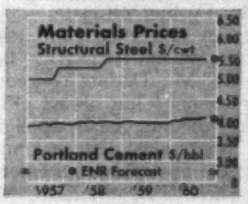
Contracts Awarded In 50 States By Type	This Week millions	Cum. 42 wks 1960	Chge '59-'60 %
All Heavy Construction	$400.2	$18,905.7	+13
By Ownership			
PRIVATE	235.2	10,255.3	+22
PUBLIC	165.0	8,650.4	+ 4
State & Municipal	135.0	6,737.6	+13
Federal	30.0	1,912.8	−20
By Type of Work			
PUBLIC			
Waterworks	5.9	383.2	+18
Sewerage	12.6	477.1	−10
Bridges*	10.2	671.2	+41
Highways	54.5	2,769.3	+14
Earthwork, Dams & Waterways	13.3	640.8	−13
Buildings:			
Excl. Housing	45.3	1,975.4	− 9
Housing	4.7	542.3	− 1
Unclassified	21.1	1,196.6	+ 4
PRIVATE			
Buildings:			
Mass Housing	143.3	5,021.9	+33
Commercial	29.2	1,997.5	+12
Industrial	53.2	2,283.0	− 6
Unclassified	6.9	947.4	+122

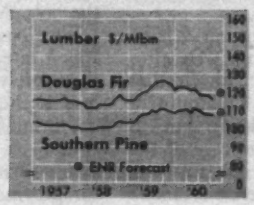
*Includes Private bridges

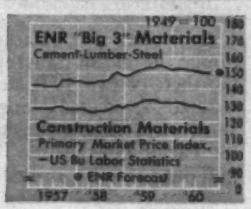
NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Oct. 13 millions	Cum. 41 wks 1960	Chge '59-60 %
Corporate Securities	$ 54.2	$ 2,693.4	−12
State and Municipal:			
All Except Housing	77.3	5,233.4	+10
Housing	....	189.3	+152
Federal Loans	1.5	160.4	+43
Federal Aid	420.7	3,138.5	+ 1
Total Nonfederal	$553.7	$11,415.1	+ 3
Federal Appropriations:			
Projects in U.S.	$609.5	$ 3,165.6	−11
Outside U. S.	1.3	159.1	+3516
Total New Capital	$1,164.5	$14,739.8	+0.4



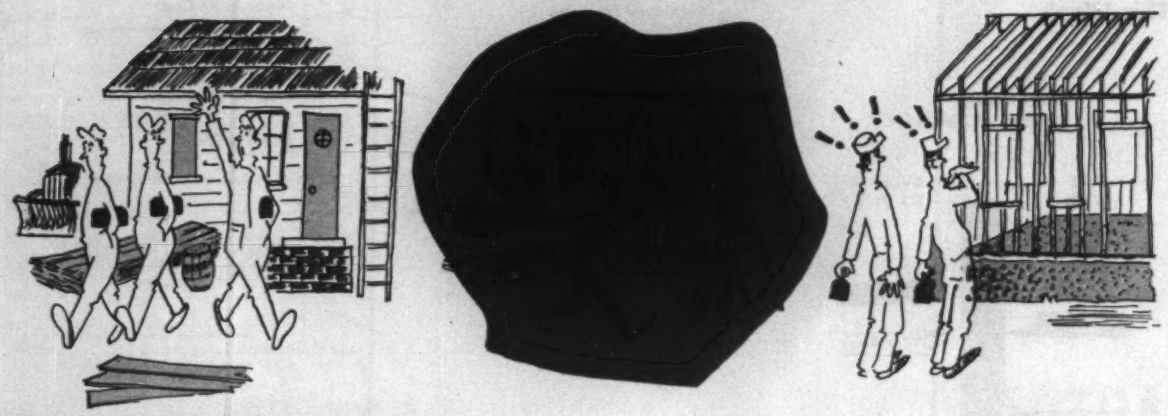




ENR COST INDEXES IN 22 CITIES, 1913=100

R: Sep. Index revised because of retroactive wage increase

City	Construction Cost Oct. 1960	Percent Change from last month	Year	Building Cost Oct. 1960	Percent Change from last Month	Year
Atlanta	649.52	0	+4.1	500.82	0	+0.4
Baltimore	754.72	0	+1.3	560.56	0	+1.3
Birmingham	674.37	0	+3.6	525.80	0	+2.1
Boston	833.21	0	+0.03	566.78	0	+0.6
Chicago	915.44	−0.1	−0.7	590.50	−0.2	+0.9
Cincinnati	839.35	−0.5	+2.6	545.13	−0.8	+0.4
Cleveland	943.40	0	+2.4	560.55	0	+1.2
Dallas	639.06	0	+5.6	523.78	0	+6.8
Denver	756.22	0	+1.3	552.27	+0.2	+1.4
Detroit	963.54	0	+2.1	605.32	0	+1.4
Kansas City	812.58	−0.7	+1.1	553.13	−1	−0.8
Los Angeles	903.85	−0.5	+3.5	564.35	−0.8	+1.3
Minneapolis	884.72	−0.6	+2.9	575.59	−0.9	+1.2
New Orleans	639.07	−0.07	+0.7	506.82	−0.1	+0.2
New York	1,038.34	0	+2.6	647.96	0	+0.3
Philadelphia	830.37	0	+4.8	588.64	0R	+1.7
Pittsburgh	885.14	0	+3.2	621.28	0	+2.1
St. Louis	895.46	0	+2.1	579.04	0	+0.5
San Francisco	877.37	−0.6	+2.8	554.58	−1	+0.3
Seattle	855.07	0	+1.9	506.06	0	−0.5
U. S.—20 Cities' avg.	829.54	−0.2	+2.2	561.45	−0.2	+1.1
Montreal	650.39	0	+3.2	466.08	0	+1.6
Toronto	689.98	−0.3	+4.8	489.87	−0.5	+0.02



When it comes to pilferage from a construction site . . .

Detective Finds 'Anything Goes'

"People will steal anything that can be moved."

Speaking is Don Darling, a private detective who specializes in industrial security. In this instance, Mr. Darling is not talking about thefts from public buildings, private residences, factories, stores and other types of commercial enterprise; he's talking about construction and the financial toll extracted from contractors by grand and petty larceny.

And when Mr. Darling says "anything," he means "anything." He cites the theft of two 40-ft steel towers that were to be erected along the route of an electric power transmission line in the Pacific Northwest. The case of the purloined towers turned out to be a community effort. The "civic-minded" residents of a rural town decided that the steel tower sections would be the quickest and cheapest means of supplying a long-needed bridge across a ravine near the community. They dismantled the still unfixed towers and moved them in sections to the "bridge" site.

Mass theft of massive equipment may be unusual. But theft, petty and massive, is common to every kind of construction job.

The project manager on a drydock construction site arrived one morning to find the following items missing: one four-ton dump truck, one four-wheel air compressor, 24 lengths of air hose, four jackhammers and four bits.

Investigators eventually found the equipment on a nearby farm owned by one of the workers at the drydock. He was using the loot to clear a field of boulders.

Theft in construction is not just a matter of screws and nails—cranes, bulldozers and even pavers vanish overnight with weird frequency. But the barrels of nails, bags of cement, board-feet of lumber and small tools alone would add up to a huge pile of money in the course of any 12 months.

On any given project a contractor can expect theft to add from 3% to 5% to his costs before he completes the job, Mr. Darling estimates.

This cost may run lower if the items stolen are eventually recovered. But they rarely are, Mr. Darling concedes. Nor is the economic loss always offset by insurance; because many policies contain a "mysterious disappearance" clause that sets up rigid requirements for proving theft. Parenthetically, Mr. Darling emphasizes that the contractor who has a tight system of accounting and control stands the best chance of recovering all or part of his financial loss from insurance.

But even an airtight insurance claim cannot make up all the financial loss resulting from the theft of heavy equipment or a vital component. The disappearance of a bulldozer can raise havoc with payroll expenses and job progress. The bulldozerless operators still must be paid; the job still must finish on time, or the contractor may have to make penalty payments to the owner.

Of the jobs most vulnerable to theft, housing developments lead all the rest. Most thievery from housing developments under construction is done by the "nicest people." The struggling homeowner who would be shocked at the thought of sneaking a 10-cent newspaper from an unattended rack thinks nothing of ransacking a housing site nearby when the do-it-yourself urge strikes him on a weekend.

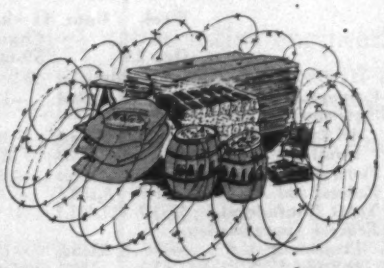
The half-dozen or so 2x4s, and the few bricks and a little cement for a backyard grill taken by one such person may not hurt by itself. But when multiplied several times, as is frequently the case, a builder is hurt in the profit columns.

While "professional" thieves occasionally will take materials, equipment, plumbing fixtures and appliances by the truckload, it is the casual thievery by the neighbors, and also by building trades workers at the site, that consistently runs up costs.

On other projects, workmen are a major menace. To discourage pilferage by workmen, Mr. Darling recommends that supervisory personnel be held responsible for maintaining security during working hours. They should institute a materials and equipment checkout system at quitting time.

On a large site, a road project for example, Mr. Darling recommends construction of one or more wire enclosures for equipment and materials at key points.

Such a compound should be at least



Recommended: Wire enclosures

9 ft high; the hogwire should be topped by three strands of barbed wire; there should be but one entrance, padlocked nights and weekends.

Accurate scheduling of materials delivery will add to the value of the enclosure; the less time materials lie around, the more there will be to use.

The compound is most effective when patrolled by an armed guard. This service costs about $3.50 per man hour.

Many construction jobs do not lend themselves to the conventional security measures used in other industries. Bell-type burgular alarms, for example, are rarely effective on a job site; and the more elaborate type of electrical warning services are even less practical.

Protective devices particularly suitable for construction may be coming. A California electronics company is considering the development of a sensory unit to be mounted on heavy equipment and materials. Anyone coming within a certain distance of the unit would set off a signal transmitted to a central guard station.

But theft is not the only hazard. Because many contractors still have lax accounting and auditing methods, embezzlement is almost irresistible.

Tightening of accounting and auditing procedures is a partial remedy. Mr. Darling also strongly advocates investigating all key employees, "even the old trusted ones."

Some industrial security agencies charge as little as $7.50 per person for an investigation, which includes a check of criminal files, a credit check and interviews with previous employers.

It's estimated that a reduction of one-half percent in loss factors is equivalent to a gain of 6.6% in gross income, when considered in terms of time losses and accompanying penalty clauses, diversion of capital, replacement problems and other inconveniences.

Virginia Sets More Rigid Prequalification Standards

Virginia is tightening its prequalification requirements for contractors bidding on highway commission jobs.

Contractors who plan to bid for road contracts now must supply detailed information on their finances and construction experience. The data will be screened by a three-man committee, which will rate each contractor as to the maximum amount of road work that can be awarded to him.

Previously, a contractor could bid for any size highway project. A department spokesman said many contractors went beyond their financial capabilities and defaulted.

Danish Building Costs Way Up

Building costs in Denmark have soared in the last four years—one unwelcome result of an economic boom.

Demand for housing and industrial plants is far in excess of the nation's labor and materials capacity. And as factories and housing are produced, demand also swells for supporting community facilities—schools, hospitals and ports.

About 30,000 residential units are now under construction. This compares to full-year totals of 18,000 in 1958 and 22,000 in 1959. The upper limit of the Danish building trades' capacity is placed at 25,000 housing units annually.

The excess of 5,000 or 6,000 residential units has wrecked havoc in the building and construction trades. Materials capacity also is stretched far beyond its limits with the result that actual wages and materials prices are much higher than those indicated by official cost indexes. Materials and labor covertly go to the highest bidder. And piled on these outlays are others that result from delays in delivery of materials and seriously undermanned work crews.

Blame for the inflation is placed on a Minister of Construction who was forced to resign earlier this year. His office underestimated the volume of housing planned for construction by private builders, so it authorized low interest governmental loans to cooperative building societies. These organizations started construction this year on 5,000 to 6,000 new residential units, which have turned out to be the straw that broke the burdened back of the construction industry.

Following the resignation of the Construction and Building Minister, the government prohibited all new housing starts. This has been lifted in many parts of the country, but still is in effect in Copenhagen where the greatest volume of construction of all types is under way.

A notable example of sky-rocketing costs and delays that have resulted from labor and materials shortages towers over Copenhagen; it is the 22-story SAS hotel, owned by the Scandinavian Airlines System. Started in 1956 at a planned cost of approximately $3.5 million, it was scheduled for completion in 1958. But it was still unfinished, and cost rose to $4.2 million.

By 1959 it was still under construction and cost soared to $5.7 million. By this time, the SAS budget for the building was strained and SAS asked for and obtained a financial assist from Copenhagen's municipal government.

The structure was completed only late this year and the final cost is placed at about $8.5 million.

Yea to Neighs Means Contracts

Authorization of parimutuel harness racing by six Pennsylvania counties and a subsequent court ruling that the approval was constitutional has resulted in a construction potential of about $68 million—the value of proposed harness track plants contained in applications from seven racing associations to the Pennsylvania State Harness Racing Commission.

The commission is expected to grant four harness track licenses before the end of this year. More may be granted next year.

Construction will start soon after licenses are granted.

Seven applications have come from sponsors in the Greater Philadelphia area. The associations, estimated construction cost and track locations are:

- Liberty Bell Racing Association, a $12-million plant at Philadelphia.
- Keystone Trotting Association, Inc., a $12-million track at Bensalem in Bucks County.
- Commonwealth Racing Association, a $6-million to $8-million track near Dowington in Chester County.
- Eagle Raceway, Inc., an $8-million track also near Dowington.
- Delaware County-Keyston Raceway Corp., a $10-million track at Eddystone.
- Concord Trotting Park, Inc., a $10-million track near Birmingham.
- Uwchland Raceway, Inc., an $8-million plant near Pottstown.

Former Clock Producer Buys Building Companies

The New Haven Clock and Watch Co. recently bought an Ohio construction company and its four subsidiaries.

Terms of the purchase of Hubbard Estates, Inc., and its affiliates, were not disclosed. Hubbard and its companies, Youngstown Home Investors, Inc., Perry Heights, Inc., North American Builders, Inc., and Hexco, Inc., will build about 1,000 houses this year valued at $15 million.

Business in Brief . . .

• **Expanded plans**—Rohm & Hass Co., Philadelphia-based chemicals producer, will spend $12 million for construction at its recently acquired plant at Louisville, Ky. This is $2 million more than was originally planned last February.

• **Contracted Plans**—A $22-million modernization project at Aluminum Co. of America's smelting works at Badin, N. C., has been postponed for an indefinite period. A spokesman attributed the delay to "business conditions at the present time." The program will be reinstated "when business conditions warrant . . ."

• **Power outlays**—Portland General Electric Co., Portland, Ore., will spend about $17 million for substation construction and improvements, transmission lines and distribution lines.

• **First step**—University of Rhode Island at Kingston will spend $3.5 million for campus remodeling and two new buildings. This will be the first phase of a long-term improvement and expansion program.

• **Port spending**—Seattle voters will act Nov. 8 on a proposal to sell $10 million worth of bonds to continue a $35-million port construction program. Largest project in the proposed program is construction of a $6.5-million container-ship terminal.

• **Expansion in steel**—Armco Steel Corp. will spend $95 million for expansion of its plant at Ashland, Ky. Under way is $101 million worth of construction.

• **Highway design contract**—Michael Baker, Jr., Inc., Rochester, Pa., consulting engineering company, will design a 30-mile section of the Allegheny Expressway. The agreement with the Pennsylvania Department of highways covers Section 1 of the proposed road. Fee is $246,500.

• **AEC cuts blueprint cost**—The Atomic Energy Commission is reducing to 17 cents a square foot the cost of prints of drawings, photos, sketches, design criteria, specifications and parts lists prepared as part of various engineering and construction phases of the U. S. nuclear energy program. A new reproduction process makes the price cut possible.

• **Spokane Freeway**—The Washington State Highway Commission gave final approval for the downtown section of the Spokane Freeway. Total cost, including $10 million for rights-of-way, is estimated at $33 million.

• **Hotel proposal**—Request for a special permit for construction of a $5-million hotel and shopping center was submitted last week to the Garland, Tex., City Planning Commission. The request was made by Aubrey Pate of that city.

• **Parking program study**—Wilbur Smith and Associates, New Haven, Conn., traffic consultants will develop a parking program for Richmond, Va. The firm will receive $6,800 for the study.

• **Calling it quits**—J. A. Bader & Co., Wilmington, Del., general building contractor, voluntarily is going out of business. Merwin O. Bader, president of the 50-year-old company, attributed the dissolution to "the cumulative effect of increased competition, diminishing profits and no members of the family ready to continue the business."

• **Big spender**—Walla Walla, Wash., District of the Corps of Engineers will lay out $193 million for construction in the district by next July 31. The total includes $38 million of new contracts to be awarded and $155 million for continuing contracts.

• **Full steam ahead**—The Rural Electrification Administration has loaned $25 million to the East Kentucky Rural Electric Cooperative Co. for construction of a 100,000-kw steam generating installation near Burnside, Ky. About $17 million will go for construction of the Burnside plant and the remainder will be used for construction of 342 miles of transmission lines and six substations.

• **Industrial development**—Terminal Construction Corp., Wood-Ridge N. J., has signed an agreement to develop 1,400 acres in Bergen County as an industrial tract. Owner of the land is Wendick Co. The 10-year development program is expected to result in $200 million worth of construction.

Road Authority Isn't Exempt From Suit

The U. S. Court of Appeals at Philadelphia has stripped the Pennsylvania Turnpike Commission of its immunity from lawsuits stemming from motor vehicle accidents on the turnpike.

The court reversed a federal district court decision that had dismissed a $200,000 damage suit against the commission brought by an Illinois motorist on grounds the commission could not be sued without its consent. The Court of Appeals ordered the suit returned to the district court for trial.

The action was brought in 1955 by the father of a boy critically injured in a collision on the turnpike. The suit contended the boy was permanently disabled in the crash. It charged that the commission operated the turnpike in a "careless and negligent manner," by having failed to provide a guardrail along an embankment. The plaintiff said that had the car been prevented from rolling down the embankment, the boy's injuries would not have been as serious.

Counsel for the commission had argued the agency was "cloaked in sovereign immunity" because it is a "creature of the state," and, like the state, could not be sued without consent.

The appellate court also ruled that the suit was within the jurisdiction of the federal district court. Counsel for the commission had contended that the federal court did not have jurisdiction.

Plea to Halt Bridge Job Rejected; Appeal Filed

A Washington State lower court has rejected a plea to bar a start on the second floating bridge across Lake Washington near Seattle. Request for the enjoinment was made by a holder of bonds issued by the Washington Toll Bridge Authority (ENR Aug. 18, p. 141).

The court's decision was appealed to the State Supreme Court, with a hearing scheduled for November 10. Although work has not yet started, a spokesman for the Bridge Authority said the project will go ahead before the hearing.

The plaintiff charges that the original bid call stipulated award of the contract within 90 days of bid opening. Legal and financial hurdles, however, forced extension to the contract several times since the project was awarded in September, 1959, to Guy F. Atkinson Co. of San Francisco. Contract price is $10.9 million.

The plaintiff says the state had no right to extend the time, even though it was agreeable to the contractor.

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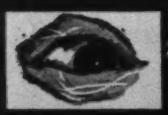

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Maintenance Agreements Multiply

- **A committee of construction union presidents is pushing use of standard, international contract.**
- **Union official says some thirty such agreements now exist; calls job protection a "vital issue."**

The construction industry, with the help of the AFL-CIO building trades unions, has made considerable progress in procuring industrial maintenance contracts, according to O. William Blaier, second general vice president of the carpenters union.

In a report to delegates attending a special convention of the union in Chicago last month, Mr. Blaier said some 30 continuing, contract maintenance agreements are now in effect or awaiting plant completions.

For years, one of the problems that has troubled the building trades has been their ineffectiveness in retaining the toe hold they get in industrial plants during the construction stage. When the work is completed, members of the construction industry pull out and the continuing maintenance work is generally lost to the union that represents the production workers.

In an effort to increase job opportunities in the maintenance field, the general presidents of the building trades unions have turned their attention with some success to a simple proposition: "If we want that work, we've got to stay in after the construction work is completed."

They have organized a special committee to develop and promote the use of a standard, international agreement for maintenance work on a continuing basis. It is called the President's Committee on Contract Maintenance. Chairman of the committee is John J. McCartin, assistant general president of the plumbers union.

Prototype of the agreements that have been developed is one with Catalytic Construction Co. covering maintenance work at the relatively new Tidewater Oil plant in Delaware City, Del. The contract was signed by 13 general presidents of the building trades unions.

Mr. Blaier called the loss of construction work to factory workers a "vital issue" and said it could become a "Waterloo of the construction workers" if not combatted successfully.

He estimated that $17 billion is spent on maintenance work each year and said that in some industries, such as oil and chemical, maintenance staffs are often larger than the production forces.

"The construction industry, as you well known, is rapidly advancing," he told convention delegates, "and we are in favor of this march in progress, but you must also be reminded of the fact that innovations made in building materials are cutting down the actual time of construction of buildings, factories, bridges and highways.

"Contract maintenance, therefore, will and can afford you an avenue once again to return to the construction site, maintain what you built and receive many more hours of employment."

The tug-of-war between craft and production unions over in-plant construction, modification, repair and maintenance work is one of the toughest internal problems the AFL-CIO has had to face. And because it is of vital interest to contractors, promotion of maintenance by contract has been a top-priority item on the agenda of the Construction Industry Joint Conference. It has stressed the advantages of the contract system in a brochure called "Maintaining Production for America."

Getting a contract maintenance agreement, Mr. Blaier said, is "by no means an automatic affair."

When the Presidents' Committee on Contract Maintenance was formed, he explained, the building trades unions agreed that they would sign a contract and furnish workmen to any contractor who could secure from an owner a contract under which maintenance work would be performed by the various building trades unions. "Such a contract is presently available to a contractor, whether he be a general contractor, a mechanical contractor, a specialty contractor or any combination of the same in a joint venture if the contract with the owner or awarding authority covers continuity of maintenance work," he said.

Mr. Blaier pointed out that the committee meets monthly for the negotiation and administration of contracts and meets with interested contractors to discuss potential contracts. He suggested that union contractors who are awarded continuity of maintenance contracts get in touch with Mr. McCartin (901 Massachusetts Ave., Washington 1, D. C.) for information on the international agreement procedure.

Mr. Blaier said the agreement provides "for the payment of building construction wage rates, plus various fringe benefits. Necessary modifications apply for the most part to time and one-half for over-time work instead of double time excepting Sundays and holidays; no lockout or strike provisions are made; nonpayment of subsistence, travel allowance, mileage or travel time, and provisions for establishment of multiple shifts."

Among the existing contracts, Mr. Blaier said, are these:

- The Austin Co.—Covering work at Dow Chemical Co. plants in Bay City, Mich.
- Catalytic Construction Co.—Six contracts in the United States and nine in Canada. U. S. contracts include work at the Convair Astronautics missile base project near Cheyenne, Wyo., and two Bomarc installations.
- The H. K. Ferguson Co.—Maintenance and construction at Offutt Air Force Base Missile site, Omaha.
- Fishbach-Moore & Telepsen Petro-Chem, a joint venture—Construction and maintenance at the Langley Air Force Base missile base, Newport News, Va.
- The Fluor Corp.—Five contracts, including one at the Fibreboard Paper Products plant in Emeryville, Calif. (ENR, Dec. 17, 1959, p. 239).
- Louisiana Industrial Services—Covering work at U. S. Rubber Co.'s Naugatuck Chemical Division, Baton Rouge, La.
- Nichols-Southern Division, Yuba Consolidated—Two in Louisiana, one being a joint venture with H. E. Wiese.
- Pacific Crane & Rigging and Ets-Hokin & Galvan—A joint venture for work at Convair Astronautics, San Diego, Calif.
- Vinnell Corp—Covering work at Fairchild Air Force Base, Spokane, Wash.
- Wellman Lord Engineering, Inc.—Work at five chemical plants in Florida.
- Wilhelms Construction Co.—Covering work at the Reichold Chemical plants in Elizabeth, N. J.

Mr. Blaier also called for "positive action" to meet another threat to the industry—loss of missile base work to missile manufacturers.

MINNEAPOLIS, MINNESOTA—Johnson, Drake and Piper, general contractor in heavy construction work, use Huber-Warco equipment on many of their projects. This Huber-Warco 8-12 ton tandem roller is compacting base inside concrete forms on one of the company's turnpike projects in the Buffalo, New York area.

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Rothman Explains 'Pre-Hire' Section

General counsel of Labor Board says Landrum-Griffin law does not upset traditional rights to strike

The pre-hire section of the Landrum-Griffin labor law does not deny labor unions the right to strike for traditionally lawful objectives, according to the general counsel of the National Labor Relations Board.

In one of the first authoritative discussions of a highly controversial section of the law, Stuart Rothman expressed these unofficial views last week:

• A construction union cannot strike to get a pre-hire agreement. The law allows a contractor to recognize and bargain with a union that has not established its majority status, but the recognition must be voluntary.

• After recognition has been accepted, however; a union can strike for a seven-day union shop clause, for the right to refer job applicants and for contract clauses specifying experience or seniority qualifications for employment.

Speaking at an AFL-CIO convention in Nebraska, Mr. Rothman warned that his views are only a guide to present thinking, which is subject to change at any time as "experience" with the law increases. "As a matter of fact," he said, "so far there have been few situations before the agency arising out of the new (pre-hire) Section 8 (f), so that for the most part we are still in an undecided area."

He cautioned that the law is full of "mysteries," but said that this is what the construction industry can expect:

"We at the office of the general counsel shall not always be able to solve all problems to the satisfaction of every side in every case, but you may be assured that the building and construction industry's special problems as evidenced by special provisions will receive our sympathetic consideration. To the greatest extent possible, traditional and lawful institutions within the industry will be fully respected, and the rights of employees, employers and labor unions safeguarded."

In approaching the pre-hire provision of the law, Mr. Rothman made two points that help to explain his interpretation of the law:

• Although the entire section is often referred to as the "pre-hire provision," it contains four separable parts. The first authorizes the execution of labor contracts without first determining the majority status of a union. The other parts—union shop, union referral and hiring criteria—stand on their own feet and are not subject to any limitations that may be read into the pre-hire authorization.

• The legislative history of the section clearly shows that pre-hire agreements must be voluntary and that strikes or other coercion to get them are not authorized. The other clauses cover matters over which unions have had the right to strike or picket and there is no clear intent to limit that right.

Mr. Rothman's major premise is that the right to strike is "guaranteed and protected" by law and must not be set aside lightly. He feels that congressional preoccupation with pre-hire agreements unwittingly led to the application of the "pre-hire" tag to the whole section. But this, he explained, does not justify extension of the denial of the right to strike to the rest of the clause.

"There is no indication that Congress wanted to limit the right to strike with respect to seven-day union security provisions, referral agreements, or agreements specifying qualifications for employment," he said. "It is not too clear what Congress wanted. . . . Under these circumstances it is believed that the section is entitled to sympathetic and non-restrictive interpretations in the light of the special problems of the industry. Other unions, once majority status is established, can strike for these things and the building trades ought not to be precluded from doing likewise."

In the course of his analysis, Mr. Rothman raised and did not answer a number of other questions which sound like a familiar echo of the situs picketing controversy:

• What is the "building and construction industry" to which the pre-hire section relates?

• Which unions and employers are "engaged primarily in the building and construction industry?"

The National Labor Relations Board and the courts will eventually determine what the new labor law means. Mr. Rothman said he hoped his "working approach" to some of the construction industry problems would "be of value" in the meantime.

Court Curbs Contracting Out

Union efforts to curb industrial management's right to have work performed by outside contractors have received another assist from the courts.

A state court in Tennessee decided last month to follow federal law and adopted the U. S. Supreme Court proposition that a labor union can force an employer to arbitrate its right to contract out work if its labor contract provides for arbitration machinery and if it fails to spell out the management functions reserved.

The Tennessee Court of Appeals ruled that an electric power company, which laid off 13 workers and then contracted out work, created a labor dispute that was subject to arbitration under the grievance machinery of the company's labor contract.

The labor agreement with the electrical workers union was silent on the right to contract out work. But it gave the employer "sole" discretion in laying workers off and stated, "Nothing in this agreement shall be construed to require that the employer hire any person not required in the proper and efficient operation of its properties."

The company argued that the disputed actions it took were management functions reserved by these provisions and placed beyond the scope of the labor contract's arbitration machinery. But the union contended the actions violated the labor contract assurance of "full-time employment" and the contract's protection against hiring and firing practices aimed at weakening the union. Thus the layoffs and the contracting out inescapably raised an arbitrable question of contract "interpretation," it said.

Although the court refused to judge the merits of the union claim, it said it was compelled to follow the U. S. Supreme Court rule in the Warrior Navigation case. The rule: Even the exercise of management prerogatives is subject to arbitration if not clearly put beyond the reach of a labor contract arbitration clause.

One of the justices, in a concurring opinion, said the Supreme Court rule is without "reason" or "authority." "I believe the complainant cooperative (the employer) was well within its legal rights in the orderly and efficient conduct of its affairs," he wrote, "when it contracted out part of its work." But it is "useless," he said, to try to fight the Warrior case.

Labor in Brief . . .

• **Workmen's compensation**—An average increase of 2.1% in workmen's compensation rates in Missouri and of a 7.7% in Florida became effective September 1. New rate schedules that mean average reductions of 3.3% in Oklahoma and of 2.6% in Pennsylvania have been approved.

• **It doesn't require a union**—About 300 workers of the Pentagon Construction Co. of Montreal walked off a job in Labrador last month for higher wages, better living conditions and improved transportation facilities. The workers are not represented by any union.

• **Defense fund**—The plasterers international union has established an International Defense Fund, based on voluntary contributions, to help finance litigation, strikes organization. Union President Edward Leonard says the action is "defensive" and aimed primarily at "fly-by-night and fast buck" contractors who exploit anti-union sentiment. Suggested membership contribution is one hour's pay a month.

• **Wage increase**—Hourly paid workers of Ontario Hydro Electric Co. have negotiated a nine-cent hourly wage increase. Linemen, electricians and other skilled trades will get seven cents retroactive to April and another two cents on November 3. A cost-of-living escalator clause was dropped, subject to reinstatement if the next contract is a long-term one.

• **No supervisors**—A Cincinnati teamster strike over the alleged use of company supervisors as truck drivers on two city street projects has ended with a promise from the contractor not to use supervisors to do work of union members.

• **Right-to-work**—The question of whether an employer can be required to bargain with a union for an agency shop clause in a right-to-work law state will come up for oral argument before the National Labor Relations Board next week. Case involves an unfair labor practice complaint against General Motors Corp. for refusing to bargain with the United Auto Workers on the issue in Indiana.

Operating Engineers Put Off Claim

A statewide local of the operating engineers union in New Jersey has been forced, at least temporarily, to give up its claim of work jurisdiction over operation and maintenance of core drilling machines.

The suspension occurred under a stipulation agreed to in federal court after the union had struck an estimated $400 million worth of work.

Targets of the strike were test boring contractors working on a Jersey City project of Public Service Electric & Gas Co. and a jet airport under construction by the Port of New York Authority at Myersville.

Both contractors had assigned the work of operating core drilling machines to members of a core drillers local with which they have labor contracts. The local is affiliated with the carpenters union.

Unfair labor practice charges were filed with the National Labor Relations Board, claiming that the engineers had engaged in an unlawful secondary boycott to force a work assignment in their favor. The going rate claimed by engineers for such work is $184 a week for 40 hours.

The dispute is the latest in a long series of disagreements over the work jurisdiction of the New Jersey union. Efforts of the engineers to force contractors to hire members of its union on a long list of power tools and equipment has blocked for nearly six years the conclusion of a formal labor contract with members of the Building Contractors Association of New Jersey.

The contractors have argued in the past that the union is seeking completely unnecessary "push-button" and "stand-by" work. They petitioned Congress in the last session for a labor law amendment banning union "featherbedding" practices.

When the unfair labor practice charges were filed in the present dispute, the NLRB moved in federal court for an injunction. Under the stipulation that was reached, the court retains jurisdiction pending the board's disposal of the charge. Hearings on the dispute commenced this week.

The union agrees in the stipulation not to violate the work assignment provisions of the law pending the outcome of the board proceedings, which moved into the hearing stage this week.

September Job Figures Called Below Normal

Employment in the construction industry dropped by 60,000 last month to a total of 3,057,000. The number of workers employed, however, was 14,000 more than it was a year ago.

The statistics are part of the mixed monthly employment report issued last week by the U. S. Department of Labor.

Total employment in all industries declined by 500,000 to 67.8 million but unemployment dropped by 400,000 to 3.4 million. Although this produced a slightly lower figure for the seasonally adjusted rate of unemployment—down to 5.7% from 5.9%—the September rate was about the same as a year ago during the steel strike and higher than any month this year except August.

Seymour Wolfbein, one of the department's manpower specialists, called the unemployment picture "by no means satisfactory, no matter what standards you use."

The 60,000 rise in manufacturing employment was below average. "This was the fourth successive month in which changes in manufacturing employment were not up to seasonal expectations, "according to the department report.

The factory workweek dipped sharply to 39.6 hours in both the durable and nondurable goods industries. Every industry group except transportation reported a shorter workweek this year than a year ago.

New Settlements Reached In San Diego, Houston

Two construction strikes in the San Diego, Calif., and Houston, Tex., areas have ended with the negotiation of long-term labor contracts that add 12 cents an hour or more a year to labor costs.

The San Diego strike, which lasted 45 days, involved laborers in sand, gravel and rock plants and teamster drivers of ready-mix trucks. Both unions settled for a 40-cent hourly wage increase spread over two years.

Under the first increase, drivers of transit-mix trucks with a capacity of 3 yd and under receive $3.02 an hour. New rate for trucks of 3- to 6-yd capacity is $3.15 and for trucks of more than 6-yd capacity it is $3.20. Laborers now receive $3.08 an hour under the new contract.

In Houston, the pipefitters settled for 39 cents over three years after a 27-day strike that stalled $52 million worth of construction. The increase is payable in three annual installments of 15, 12 and 12 cents. The first boost gives the pipefitters a scale of $3.95 an hour.

Fraud Makes Contract Voidable

A contractor who has been induced to enter into a contract by fraud or misrepresentation may rescind the contract but he then forfeits his right to the profits he may have lost.

In a Pennsylvania case, for example, the question came before the court this way:

A prime contractor brought an action against a subcontractor to recover damages for refusing to proceed with the work. The subcontractor counterclaimed rescission of the contract on the ground that he had been induced to enter it as a result of false representations made by the prime contractor and sought to recover loss of profits from the job. The court[1] held that the subcontractor had been induced to enter into the contract in reliance upon false representations made by the prime contractor and dismissed the action brought by the prime contractor to recover damages resulting from the failure of the subcontractor to proceed with the work and also dismissed the subcontractor's claim for lost profits, the court holding that since he rescinded the contract he was not entitled to any loss of profit that he might have made had he performed the work.

The court stated: "Where a party is induced to enter into a transaction with another by means of the latter's fraud or material misrepresentation, such a transaction can be avoided by the innocent party. Fraud arises where the misrepresentation is knowingly false or where there is a concealment of facts calculated to deceive. Fraud renders a transaction voidable even where the misrepresentation is not material. A misrepresentation is material when it is of such a character that if it had not been made, the transaction would not have been entered into. See Restatement of the Law of Contracts, sections 470, 471, 476."

(1) Clement Martin, Inc. v. Gussey, 157 A. 2d 412, Superior Court of Pennsylvania, December 17, 1959.

Partial Payment Isn't Discharge

When a definite amount of money is due a contractor, the contractor's acceptance of a check for a lesser amount does not bar the right to sue for the balance, if no release has been given, even though the check bears the notation that it represents payment in full.

At least that is the law in Maryland, according to the following case:

A contractor filed a suit against the owner and its surety to foreclose a mechanic's lien to cover the balance due for work performed.

Under the contract, the contractor was to be paid for the cost of all materials, plus 25% profit, plus $5 an hour for labor. The owner was to make progress payments.

After the contractor had done $6,000 worth of work, he asked the owner for a payment. The owner made out a check for $2,283.70 and on the back of the check, above the place for endorsement, typed: "In receipt of this check acknowledge payment in full to All Metal Fabricators, Inc."

The contractor said he would not accept the check in full payment. He took the check, however, endorsed it and deposited it.

When he sued for the balance, the owner's defense was that the acceptance of the check was an accord and satisfaction.

The court granted the contractor a recovery[1], holding that acceptance of the check did not bar the right to recover the balance in the absence of a release.

(1) Eastover Company v. All Metal Fabricators, Inc., 158 A. 2d 89, Court of Appeals of Maryland, February 16, 1960.

Substantial Performance Essential to Recovery

A contractor cannot recover the entire contract price unless he proves full performance of the contract.

A contractor in a New York case found this a stumbling block when he sued to recover the balance allegedly due under a contract.

The evidence indicated that there were certain defects in the work which the owner had to repair and the court[1] limited the contractor's recovery to the fair and reasonable value of the work.

The court stated: "The contractor cannot recover the entire contract price where defects or omissions appear."

(1) Klinick v. 66 East 80 Realty Corp., 185 N.Y.S. 2d 1009, N. Y. Supreme Court, January 19, 1959.

OFFICIAL PROPOSALS

Bids: January, 1961

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

INVITATION FOR BIDS—NO. YS-3-4

The Royal Irrigation Department of the Kingdom of Thailand hereby invites sealed written bids for furnishing and delivering the following goods, equipment, and materials either fob Contractor's shipping point or cif Bangkok Wharf, Thailand, for the Transmission System, Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents, for furnishing:

1) Nine (9) autotransformers, each 20,000 kva, single phase, Class OA/FA, 50 cycle, outdoor, 220/69 kv, complete with LTC and lightning arresters.
2) Three (3) autotransformers, each 12,000 kva, single phase, Class OA/FA, 50 cycle, outdoor, 220/69 kv, complete with LTC and lightning arresters.
3) Three (3) autotransformers, each 10,000/10,000-10,000 kva, single phase, Class OA/FA, 50 cycle, outdoor, 230/69-13.2 kv, complete with lightning arresters.
4) One (1) autotransformer, 20,000 kva, three phase, Class OA/FA, 50 cycle, outdoor, 230/69-12 kv, complete with LTC on tertiary and lightning arresters.
5) Two (2) 13.2 kv shunt reactors, 5,000 kva each, three phase, 50 cycle, self-cooled, outdoor type.

Invitation for Bids will be issued in October, 1960, and will be opened in January, 1961. Copies of Contract Documents, Invitation for Bids—No. YS-3-4, 230 KV Autotransformers and 13.2 KV Shunt Reactors, may be obtained by qualified Bidders on written request to:

Royal Irrigation Department
Attention: Thai Liaison Engineer
c/o Engineering Consultants, Inc.
1901 South Navajo Street
Denver 23, Colorado, U.S.A.

Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $25.00 for each copy of the Contract Documents requested. The remittance is nonreturnable.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department
Kingdom of Thailand
Bangkok, Thailand

October 3, 1960

Bids: November 2, 1960

Additional Work at
Nashville Avenue Wharf

Board of Commissioners of the Port of New Orleans will open bids at No. 2 Canal Street on Wednesday, November 2, 1960, at 2:00 o'clock P.M., for additional work at the Nashville Avenue Wharf consisting of completion of concrete work; enclosure for shed structure including woodwork, roofing and sheet metal work; and miscellaneous items including piping and painting.

Plans, specifications and bid forms may be secured at Room 214, upon deposit of $25.00 per set, by check payable to Board, refundable up to the extent of three sets taken out by anyone submitting a bid directly to the Board. Other sets are available at $25.00 per set, not refundable.

Prior to opening of bids, bidder shall submit evidence that he holds license of proper classification and in full force and effect under La. R. S. 37:2151, (Act 233 of 1956).

Deposit of 5% of bid, by certified or cashier's check, is required with bid.

Acceptable surety bond for amount of bid is required with notarial contract.

Board may accept or reject any bids, waive informalities and award contract in its best interest.

REQ. ENG-4709

October 13, 20, 1960

Read the Official Proposal Column of
ENGINEERING NEWS-RECORD
This Week and Every Week

OFFICIAL PROPOSALS

Bids: See Advertisement

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract PN-530.005 — Port Newark — Demolition of Steel Tank—No deposit required—Bids will be received until 2:30 P.M. on Thursday, October 27, 1960.

Contract BP-210.006—Brooklyn-Port Authority Piers—Demolition of Buildings at the Foot of Warren Street—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Tuesday, November 22, 1960.

Contract BP-130.007—Brooklyn-Port Authority Piers—Demolition of Buildings at Columbia Street Between Warren and Congress Streets—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Tuesday, November 22, 1960.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, October 20, 1960

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5423) will be received at Hardin, Montana, until 10 a.m., Mountain Standard Time, November 29, 1960, for furnishing labor and materials for Earthwork, Structures and Surfacing Access Road and Service Roads—Yellowtail Dam, Yellowtail Unit, Montana, Missouri River Basin Project. Location near Hardin, Montana, in Big Horn County. Principal items are Excavation 386,000 cu. yds; 2,400 lin ft. corrugated metal pipe; 48,000 tons crushed rock base and surfacing; and other work. Completion time 360 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; Box E, Hardin, Montana; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5421) will be received at Madera, California, until 10 a.m., Pacific Standard Time, November 22, 1960, for furnishing labor and materials for Earthwork, Pipelines and Structures, Laterals 57.9, 59.3, 60.9 and 62.9 and Sublaterals, Stone Corral Irrigation District, Friant-Kern Canal Distribution System, Central Valley Project, California. Location near Fresno, California, in Tulare County. Principal items are Excavation—135,000 cu. yds; 162,500 lin. ft. Pressure Pipe—8 to 30 inches in diameter; 22 Pumping Units; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, P. O. Box 689, Madera, California; P. O. Box 2511, Sacramento, California; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for test piles and pile load test at the U. S. Custom Court and Federal Office Building, New York, N. Y., Project #30905, will be received until 2:00 P.M. EDST October 28, 1960 and then publicly opened. Bidding material may be obtained from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y.

OFFICIAL PROPOSALS

Bids: December 13, 1960

Philadelphia, Penna. Procurement Department Water Department

Sealed bids will be received in Room 313, City Hall Annex, until 2.30 P.M. (E.S.T.) on Tuesday, December 13, 1960, and opened at that time, for Bid No. 2650—Work No. S-2730-F.

Wakeling Street Relief Sewer in Vankirk Street from Edmund Street to 20 Feet N.W. of Charles Street.

PRINCIPAL ITEMS OF WORK

Excavation in Tunnel	24,700 cu. yds.
Excavation—Open Cut—Shafts, Manholes and Sewer	1,000 cu. yds.
13' Dia. Concrete Sewer in Tunnel	3,508 lin. ft.
13' Dia. Concrete Sewer in Shaft	14 lin. ft.
Manholes	7

Proposal forms, questionnaires and specifications may be obtained from the Water Department, in Room 1132, City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. Blueprints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Company, 1230 Arch Street, Philadelphia 3, Penna.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions answered must be filed with the Water Commissioner, Room 1113, City Hall Annex, at least one (1) week prior to the date of opening bids.

Each proposal must be accompanied by security in form and amount as set forth in the proposal form.

District of Columbia—Highway Construction—Dept. of Hwys. & Traffic, Sept. 26, 1960. SOUTHWEST FREEWAY INNER LOOP—CENTER LEG CONNECTION — RAILROAD STRUCTURES AND ROADWAYS, FEDERAL AID INTERSTATE PROJECT NO. I-IG-95-1(6)2—Invitation No. C-6138-H, consisting of 15,372 cu. ft. Class A Dimensioned Masonry; 5,598,000 lbs. Structural Steel; 7,479 cu. yds. Class BB substructure concrete; 1,290,626 lbs. Reinforcing Steel; and 24,190 cu. yds. structure excavation. (This project includes construction of one (1) four-track and one (1) two-track railroad structures with temporary track detours and one (1) highway structure). The Labor Dept. has predetermined the wage rates which will be incl. in Addendum No. 1. Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 PA. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D.C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, Nov. 1, 1960, in Room 424, 499 PA. Ave., N.W.

Bids: November 28, 1960

Toronto Transit Commission Tenders for Escalator Contract ES-I Bloor-Danforth University Subway Stage I

Sealed tenders endorsed "Escalator Contract ES-I, Bloor-Danforth-University Subway, Stage I" and addressed to the Toronto Transit Commission, General Secretary's Office, will be received by the Commission at its office, 1900 Yonge Street, Toronto 7, Ontario, Canada, until four (4) p.m. Eastern Standard Time on Monday, November twenty-eighth (28th), 1960.

The work for which tenders are invited consists of the manufacture and installation of eleven (11) escalators for the Bloor-Danforth-University Subway, Stage I, together with miscellaneous work appurtenant and collateral thereto as specified in the contract documents and shown on the plans.

All tenders must be on the Commission's form of tender and must be accompanied by cash or a certified cheque in the amount of $10,000.00 (Ten thousand dollars).

The successful tenderer will be required to furnish, execute and deliver to the Commission a performance bond satisfactory to the Commission in the amount and within the time set out in the contract documents.

The contract documents, including plans and specifications, will be available at the Commission's Subway Construction Branch, 1138 Bathurst Street, Toronto, on and after Monday, October 3, 1960.

OFFICIAL PROPOSALS

Copies of the contract documents may be obtained by depositing one hundred dollars ($100.00) with the Commission for each set of documents. The amount of the deposit will be refunded on the return of the plans and specifications in good condition within thirty (30) calendar days after the opening of the tenders.

The Commission reserves the right to reject any or all tenders.

No tender may be withdrawn after the scheduled closing time for receipt of tenders for forty-five (45) calendar days.

H. E. Pettett
General Secretary.

Bids: November 18, 1960

Midtown Underground Garage Stage II

NOTICE IS HEREBY GIVEN that sealed proposals for the "Midtown Underground Garage"—Stage II, will be received by the City of Rochester, Purchasing Agent, at his office, Room 36, City Hall, No. 20 South Fitzhugh Street, Rochester 14, N. Y., until 11 o'clock A.M. Eastern Standard Time on November 18, 1960, at which place and time they will be publicly opened and read aloud. The Proposals shall be for furnishing all labor, materials, equipment, facilities, transportation, and services necessary for and/or reasonably incidental to the completion of all work in accordance with the Drawings, Specifications and other Contract Documents, prepared by Victor Gruen, Architect, A.I.A., for the City of Rochester. The work is divided into seven separate contracts, each to include portions of the complete work, as follows:

I. General Construction Work Contract.
II. Heating and Ventilating Work Contract.
III. Plumbing Work Contract.
IV. Sprinkler Work Contract.
V. Electrical Work Contract.
VI. Sound and Intercommunication Work Contract.
VII. Traffic Control and Signal Work Contract.

Contractors may submit proposals for either one or more of the contracts, for which he is qualified by law, at his own discretionary option.

The City reserves the right, without liability, to reject any and all bids and return the bid security, or to award the contracts for the entire project to the lowest responsible bidders.

The City of Rochester further reserves the right to waive informalities, should the best interest of the City thereby be promoted.

The Drawings, Specifications and other Contract Documents may be examined at the office of Victor Gruen and Associates, 2 West 13th Street, New York 11, New York, and may be examined and copies thereof may be obtained at the office of the Purchasing Agent. Each set of the said documents may be obtained only upon payment of $100.00 deposit; any bidder returning such copy in good condition within thirty (30) calendar days following the opening of Proposals will be refunded $100.00 and any non-bidder so returning such copy will be refunded $50.00.

NOTE: Bidder refer only to those entities formally submitting a Proposal for a contemplated work contract to the Purchasing Agent.

Attention is called to the fact that the Proposal Form is bound under separate cover called Book One, from the Specifications called Book Two.

Proposals shall be made on the form provided in the Contract Documents, and each Proposal shall be accompanied by a certified check made payable to the City of Rochester, N. Y., in an amount not less than five per cent (5%) of the total amount of the Proposal, conditioned that the bidder will execute the Contract and deliver the required Performance Bond for the proposed work within ten (10) calendar days after the date of written notice that his Proposal has been accepted. For Proposals with total amounts in excess of $200,000, a bid bond in the amount of five per cent (5%) of the amount of the Proposal, in proper form, executed by a surety company acceptable to the City, will be accepted in lieu of the aforesaid certified check.

A bidder may not withdraw his Proposal within forty-five (45) calendar days after the opening of Proposals, but may withdraw his Proposal at any time prior to the scheduled time for the opening of Proposals.

KENNETH E. PUNNETT
Purchasing Agent
City of Rochester, N. Y.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

NOVEMBER 3 ISSUE CLOSES OCTOBER 24TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division or ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Field Supervisor. Large established midwest consulting firm has permanent position in building construction supervision for thoroughly qualified and experienced man. Mechanical engineer preferred. Moving expenses paid. Send complete resume to P-4833, Engineering News-Record.

Assistant To City Engineer. Salary to $6,588. Fringe benefits. Opportunity for varied design and construction experience. Large city planning, street, sewer and expressway programs under way. Write City Manager, Zanesville, Ohio before November 1.

Surveyor-Draftsman for Chicago Office. Must be fully qualified for drafting, computing, checking land surveys. Age, 40-55 preferred. Salary open. Furnish samples of drafting and computing in first reply. P-5417, Engineering News-Record.

Permanent Position: Structural engineer with Ph.D. or M.S. degree from well recognized engineering school. Well grounded in the Theory of Elasticity to handle complex indeterminate structures. Excellent living conditions, good future for young and responsible engineer. Submit Graduate School credits. Location North Carolina. P-5423, Engineering News-Record.

Structural Engineer, R&D, graduate CE, age 30-40. Permanent position with national engineering and products firm. Special emphasis on research and development relating to fastenings and systems involving wood construction. Applicants furnish photos and resume including salary in letter. Location: Washington, D.C. P-5418, Engineering News-Record.

Project Engineer: To Supervise the installation of Heating; Air Conditioning; Process Piping and Plumbing on large and medium size projects in the South and East Central area. Ability to handle labor, set up, and maintain an efficient organization is foremost. Willingness to work hard and assume responsibility is imperative. To the man who proves himself successful as a Project Engineer we have a Branch Manager position open for him. Please send complete information on experience, references, salary required and availability. P-5440, Engineering News-Record.

Mechanical engineer for State of Connecticut, Public Works Department. Diversified duties providing broad experience in design field. Act as liaison with consulting engineering firms. Report to Chief Engineer. 35 hour week, outstanding benefits. Headquarters at Hartford with full range of cultural, recreational, social and educational advantages available including excellent schools for youngsters and ample, accredited facilities for pursuing graduate engineering studies at night. Need college and 6 years mechanical design experience including 3 years in supervision. Merit examination will be given throughout the United States at locations convenient for applicants. Write to State Personnel Department, Room 405, State Office Building, Hartford, Connecticut.

Estimators—Southwest contractor has permanent openings for qualified Mechanical and Architectural Estimators. Must have field experience plus heavy estimating background on Power Plants, Dams, Compressor Stations and Industrial Plants. May involve overseas operations. Send full resume to P-5469, Engineering News-Record.

• POSITIONS VACANT

Director of Specifications Department. Large Midwest consulting firm has immediate opening for capable individual with broad experience in specification writing for all branches of building construction work. Must also possess administrative ability. Send complete resume of educational background and experience, including personal qualifications and small photograph to P-5347, Engineering News-Record.

Have opening for recent Civil Engineer Graduate with military obligations completed who desires to learn the construction business. Must be ambitious, aggressive, dependable, use no intoxicants, willing to start in the field on industrial buildings and heavy construction, and willing to move. Must be single. We operate throughout Kansas and adjacent states; offer excellent opportunity for advancement. Martin K. Eby Construction Company, Inc., P.O. Box 1679, Wichita, Kansas.

Engineer (Civil, Mechanical or Geological) P.E. desirable. Excellent opportunity for aggressive engineer to grow with an expanding eastern drilling contractor. Design and sales engineering, municipal and industrial water wells, water and sewage treatment and pumping tests. P-5349, Engineering News-Record.

City Engineer, City of Sioux City, Iowa Population 90,000 to head engineering department of 30 persons; report directly to City Manager. Broad civil engineering and administrative experience. Registered in some states. Minimum age 35. Beginning salary range $870-$1040 depending on the qualifications. Apply Personnel Director, Sioux City.

The City of Sioux City, Iowa needs young Civil Engineer, preferably a recent graduate. 18 million flood control project and 7 million water pollution project present unusual opportunity to gain experience in these fields. Salary range $465-$560. Apply Personnel Director, Sioux City.

Municipal Engineer for village of 60,000. Responsible for planning, designing, executing public works' projects. Minimum 5 years' experience in water, drainage, paving. Starting salary about $9,000 per year. Apply Office of Village Manager, Village Hall, Skokie, Illinois.

Chief Engineer. Large Midwest Mechanical Contractor has permanent position available for experienced engineer to supervise the design, estimating, and installation of commercial and industrial air conditioning and mechanical work. Send complete resume to P-5467, Engineering News-Record.

Village Engineer. The Village of Palatine, Ill. (Pop. 12,000) is accepting applications for position of village engineer. Must be a registered professional engineer in Illinois, or capable of becoming registered within 1 year. Experience in inspection, supervision, and planning of streets, sidewalks, water systems, sewers, building and zoning and related public works services. Furnish resume to: Village manager, 54 S. Brockway, Palatine, Ill.

Plant Superintendent—Precast, prestressed concrete products plant producing a variety of structural and architectural components. Oldest and largest concrete manufacturer in the Midwest. Engineer preferred. $10,000 salary. Send resume. P-5471, Engineering News-Record.

Chief Highway Engineer—Qualified to assume complete design responsibilities and act as project coordinator. Submit resume to A. J. Macchi, Engineer, 44 Gillett St., Hartford, Conn.

• POSITIONS VACANT

Engineers—Structural Steel Sales Promotion. We are searching for Civil or Architectural engineers, preferable age 35 to 45, to handle technical and promotional work with customers of the structural steel fabricating industry. Headquarters will be in regional offices at New York City, Philadelphia, Washington, D. C., Columbus, Ohio, Chicago, Minneapolis, Omaha, and Los Angeles. Applications should have a B.S. in C.E. or A.E. and preferably be registered. Experience in bridge and building design, and construction in both steel and concrete required. Experience in sales and promotion work desirable. Salary open depending on experience. Insurance and retirement plans available. Send complete resume, recent photo if available, and salary requirements by mail to American Institute of Steel Construction, Inc., 101 Park Avenue, New York 17, New York. All applications will be acknowledged.

Superintendent of Buildings and Grounds for suburban school system having 9 school buildings. Need responsible and experienced man to take over planning and supervision of operation and maintenance of school plant and grounds. Engineering training and construction background preferred. Address applications to Board of Education, Colonie Central School District No. 1, 100 Hackett Avenue, Albany 5, New York, giving training, experience and salary range.

Soils Engineer—M.S. degree in soils mechanics. Registered engineer under 35 years of age, location—Midwest. U. S. Citizen. P-5367, Engineering News-Record.

• EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 49 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo, N. Y.

• POSITIONS WANTED

Chief Estimator-Project Manager — Fully qualified to handle work from bidding stage to completion. Best of references. Building Construction, Heavy Construction, Sewage and Water Treatment Plants. PW-5446, Engineering News-Record.

Engineering Executive. Wide industrial, chemical and civil experience; all phases administration and management. Organize and direct large design jobs or work in consulting and exec. asst. capacities. Proposals, reports, contracts, liaison, trouble shooting. P.E. in 5 States. PW-4725, Engineering News-Record.

Chief Estimator—Engineer. 12 years experience commercial, industrial, heavy construction. Capable of handling jobs from takeoff to completion. Presently employed but willing to relocate. PW-5364, Engineering News-Record.

(Continued on the following page)

When Answering
BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

Construction Manager

Large nationally-known processing organization in the Metropolitan N. Y. area has career opportunity for a technically qualified Construction Manager.

Individual should be a graduate engineer with at least 10 years experience in all phases of industrial construction projects, including contacts with contractors, city officials, utility engineers, material suppliers, etc.

Please submit complete resume, including salary history, to

P-5428, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

WANTED

Hydraulic Dredging Manager

Capable of estimating, obtaining work, and supervising operations. Reply to

P-5307, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• POSITIONS WANTED

(Continued from preceding page)

Construction Superintendent—industrial experience—Mid Atlantic preferred. PW-5362, Engineering News-Record.

Sales: Heavy construction materials to architects, engineers, contractors, industry, municipalities. Arch. grad.; 15 yrs. exper. PW-5341, Engineering News-Record.

Construction Manager, graduate civil engineer, age 53, qualified for supervision of all phases of heavy, industrial and railroad construction, last four years Federal projects of million dollar class, preference location south or east, available 60 days, resume on request. PW-5445, Engineering News-Record.

Water Engineer, BCE, 32, married, registered, Eight years experience in surface and ground water hydrology, waste disposal, water control and related problems. Presently employed by large corporation. PW-5425, Engineering News-Record.

Superintendent General Construction, Experienced Schools, Housing 20 yrs field experience. PW-5453, Engineering News-Record.

Executive Engineer, civil, MCE. PE in N.Y., N.J., Pa. & Del. Administrative experience in all phases of project planning, design and construction supervision of chemical and industrial plants, part projects and bridges. PW-5459, Engineering News-Record.

Civil-Structural Engineer, M.S. age 35, several years experience in design and construction of prestressed and reinforced concrete structures, bridges, industrial buildings. Desires position as chief engineer with Design Engineering, Contracting or Industrial Organization. PW-5464, Engineering News-Record.

Construction Engineer, 54, Reg. (Pa., Ala.), BSCE, CE, extensive heavy, hydro construction experience. Seeks position with engineer-architect firm Virginia, South Atlantic States. PW-5466, Engineering News-Record.

Construction Executive; 38, M.S.C.E., M.B.A., broad experience all phases of industrial, marine and building construction. Interested in permanent, responsible position with progressive, growing construction company. PW-5477, Engineering News-Record.

CIVIL ENGINEERS—TECHNICIANS
for work in Southeast Asia

Personnel needed to complete Advisory Group assigned to assist Government of Vietnam in organizing a Department of Highways in the Ministry of Public Works for the planning, administration, coordination and supervision of all highway activities and appurtenant services. Following vacancies to be filled from applicants having a long and successful record of experience in responsible public works assignments: Highway Engineer, Maintenance Engineer, Budget & Fiscal Specialist, Maintenance Superintendent, Shop Superintendent, Training Specialist.

High degree of initiative, judgment and skill in handling human relations required in addition to technical competence. Up to two year employment contract. Dependents authorized to accompany except in case of field personnel. Age limit 65 years.

Only those interested in difficult and challenging work should apply. Send resume or write for application blank to

CAPITOL ENGINEERING CORPORATION
DILLSBURG *Consulting Engineers* PENNSYLVANIA

ENGINEERS DESIGNERS

Permanent positions with Arthur G. McKee & Company in Cleveland for:

ENGINEERS, DESIGNERS, DRAFTSMEN

experienced in design work on Oil Refineries, Chemical Plants, Heavy Industry or any type of Steel Plant or Steel Plant Equipment design. Applications will be kept confidential.

Send detailed resume and photo to:

G. VICTOR HOPKINS
ARTHUR G. McKEE & COMPANY
2300 Chester Avenue, Cleveland 1, Ohio

CIVIL ENGINEER

Permanent new position for graduate civil engineer in the salary range of $511 to $588 a month (plus longevity pay). Vacation, sick leave, dual pension program, and other fringe benefits. Must be U.S. citizen and possess an EIT certificate. Some related experience desired to work in design and construction of sewer, water, street, sidewalks, and curbs. Travel expenses paid on invitation and moving expenses paid for selected candidate. Personnel Dept., 404 City-County Bldg., Madison 9, Wisconsin.

WANTED

ENGINEERING ASSOCIATES

SANITATION WATER SUPPLY
(foreign & domestic)
PETROLEUM (foreign)
GEOLOGICAL & MINING (foreign)
CHEMICAL & PETRO-CHEMICAL
(foreign and domestic)
WATER RESOURCES (foreign)
HYDRO-ELECTRIC (domestic & foreign)
CONSTRUCTION (domestic & foreign)

President and Vice-President levels.
Complete charge of your own division.
Drawing account against substantial share of Division profits before tax PLUS income from own secured investment.
Minimum Investment $25,000.00
GLOBAL Activity—TOP Recognition

Send complete resume including photo to:

P. O. Box 968,
Station "B", Montreal, Quebec

CONSTRUCTION SUPERINTENDENT

Minimum 15 years experience in chemical plant construction. Graduate civil or mechanical engineer preferred. Must be willing to relocate within United States.

Reply fully and in confidence to:

PAUL S. MONROE
Vice-President

SD PLANTS INCORPORATED
2 Park Avenue
New York 16, N. Y.

WANTED

Experienced ground water Hydrologist

for immediate employment for approximately ten months contract period to set up ground water information center and design ground water program. Possibility of continued employment on salary following initial contract period. Write full particulars, including salary and expense schedule required, to E. Bruce Jones, Chief of Water Development,

WYOMING NATURAL RESOURCE BOARD
215 Supreme Court Bldg., Cheyenne, Wyoming

FIELD SUPERINTENDENTS
PROJECT ENGINEERS (Field)
FIELD ENGINEERS
PIPING ENGINEERS
MECHANICAL SUPERVISORS

For combination heavy general construction and mechanical work on power plant, paper mill, atomic energy contracts and similar type specialized general contracts thruout greater southern states area. Apply **BY LETTER ONLY** to:

Kaminer Construction Corporation
P.O. Box 227, Chamblee, Georgia

Building Construction Superintendents, Field Superintendents, Field Engineers, Masonry Superintendents, Carpenter Superintendents
POSITIONS OPEN WITH
JOHN W. ROUSE CONSTRUCTION CORP.
Send Resume to "Personnel Department"
Box 236, Gouverneur, New York

PLANT MANAGER

Preferably with experience in structural steel, miscellaneous iron or job shop steel fabrication experience. Union experience essential. Fifty man shop located in Eastern Pennsylvania. Reply stating education, experience and salary desired. All replies kept confidential.

P-5432, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

EDITOR WANTED

Must Know Road Building and/or Municipal Field

Responsible position in a fast-growing publishing enterprise is open to a civil engineer qualified by experience to serve the highway or municipal engineering and construction field. Must show enough developed journalistic ability to handle nation-wide field methods reporting and convention assignments with brief training. Age 30—50. Location Chicago. Half-time travel.

Your letter covering educational background, professional and writing experience, and salary requirements will be kept in complete confidence. Our present staff knows of this opening.

P-5419, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ELECTRICAL ENGINEERS and DESIGNERS

Several openings available for electrical engineers and designers experienced in powerplant (preferably hydro) design. Salary commensurate with experience. Please send complete resume to Personnel Manager.

HARZA ENGINEERING COMPANY
400 West Madison Street Chicago 6, Illinois

ESTIMATOR

With Chemical Plant Design Experience

Local design company needs an estimator experienced in directly developing estimates for complete chemical plants or petroleum refineries. Applicant should have a minimum of 5 years experience in all phases of estimating such as cost of fabricated equipment, electrical, piping, civil and instrument take-offs. A graduate engineer is preferred. Salary commensurate with experience. REPLY in detail concerning experience, training, salaries earned and expected to:

J. W. FEAMSTER
Personnel Manager

SCIENTIFIC DESIGN COMPANY, INC.
2 Park Ave, NY 16, NY

Sales Engineer

Experienced in fabricated structural steel industry. Opportunity to advance to Sales Manager in short time. Long established midwest structural steel fabricator. Submit detailed resume and photograph.

P-5430, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ELECTRICAL ENGINEER

TOLL COLLECTION EQUIPMENT SUPERVISOR

Consulting Engineer seeking applicants for permanent position • department head status, for major toll facility. Position includes responsible charge of operational procedures and maintenance of electronic toll collection equipment including dynamic weighers, axle counter relays, I.B.M. console equipment and remote recorders.

Prefer Graduate Electrical Engineer with basic power and electronic background. Require experience, low voltage relay circuits, electronics and allied fields and demonstrated administrative ability with special aptitude for public service.

Salary open.

Apply in writing with complete resume of experience and background.

MICHAEL BAKER, JR., INC.
CONSULTING ENGINEERS
P.O. Box 111
Rochester, Pennsylvania

SALES ENGINEER SOIL STABILIZERS

Progressive Midwest manufacturer of construction equipment has opportunity for a man experienced or educated in the field of soil stabilization and highway construction to sell the worlds' foremost soil stabilization equipment. This position will develop into a top sales management post within the near future.

Extensive travel in the U. S. and occasional foreign travel will be expected.

Send complete resume to

P-5431—Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Permanent openings for qualified

CIVIL

Several openings for experienced persons in design of structural steel and reinforced concrete applicable to design of Bridges and Buildings. Opening for Sanitary major in design of sewage and waste disposal systems.

ELECTRICAL

Need several in the design and layout of Power Plants, Test Facilities, Industrial and Institutional projects.

MECHANICAL

Several openings for men experienced on Process Piping design and layout, preparation of Flow Diagrams, and cost estimates.

Also openings for Designer-Detailers and Draftsmen.

Positions open to Engineers desiring long range employment with opportunity for professional development. Many company benefits, including paid vacations, sick leave, holidays. Excellent employee benefit plan.

Write fully, include complete experience and salary data.

SVERDRUP & PARCEL ENGINEERING COMPANY
Engineers — Architects
915 Olive St., St. Louis 1, Mo.

DISTRICT CONSTRUCTION MANAGER

Active construction company has need for a District Manager of Construction. Must be graduate mechanical, civil or chemical engineer with minimum of 20 year's experience in the chemical plant construction field; be willing to relocate.

Reply with all data including salaries earned and required in first letter in full confidence to:

PAUL S. MONROE
Executive Vice-President

SD PLANTS INCORPORATED
2 Park Avenue New York 16, N. Y.

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Don't Withhold Ottawa Data

THE BASIC PURPOSE of the $27-million AASHO Road Test at Ottawa, Ill., is to improve pavement design and performance.

To achieve this objective, research workers must analyze in detail an estimated 300 million pieces of data collected during the application of truck loads, a major phase of the test program now coming to an end. And such an analysis takes time.

But to be of greatest value, results of the test must be made available to civil engineers everywhere as rapidly as possible. Important facts learned at Ottawa should not be withheld.

Presumably, results are being supplied to AASHO member departments and to other participating organizations. Certainly, information is being fed to the Bureau of Public Roads for use in preparing major reports for presentation to Congress in January.

To date, no important results have been released to the engineering profession as a whole. Premature release could have some drawbacks—certain people felt they were badly burned by untimely release and widespread misinterpretation of the Maryland road test several years ago. But drawbacks are apt to be of little importance when measured against possible consequences of withholding valuable information.

Project officials should loosen up and publicize test results as quickly as possible. Let the chips—if there are any chips—fall where they may. Caution may have some merit here, but it should not be carried so far that those who could use results validated to date are deprived of them.

Prestressed Pavement?

PRESTRESSED CONCRETE has made notable progress in the U.S. during the past decade. The specialist industry that has fostered it has developed its own prestressing techniques, learned how to build structures economically and now is beginning to mechanize production (ENR Oct. 6, p. 34). Recently, too, it has extended its range to include prestressed construction of a 24-story building in Hawaii and a 320-ft girder-bridge span in New York.

It is noteworthy, however, that while the greatest advances have been made in applications in buildings and bridges, the greatest potential for volume production lies in pavements—highways, runways, aprons, taxiways.

Prestressed concrete pavements could be made much thinner than plain or reinforced concrete, and still be highly resistant to cracking. They have not been adopted, however, because of drawbacks, both technical and economical.

Techniques tried so far in the U.S. and abroad have generally introduced transverse joints, to permit longitudinal prestressing. These joints have proven troublesome because of their size and their lack of prestress. And the need for two-way prestressing leads to an overly thick pavement when post-tensioning is used, since the tendons have to be placed in conduit to prevent bond with the concrete. The pavements built so far have also been costly, because of the painstaking, "watchmaking" fieldwork required, and sometimes because abutments have to be constructed for jacking.

It would appear that a more radical approach to prestressing will have to be adopted if prestressed pavements are to become a reality. One possibility in this category is the scheme tried out at Brussels airport (ENR Oct. 6, p. 23). Long, factory-precast parallelograms, only 4 in. thick, were pretensioned longitudinally and laid with staggered joints to form a taxiway. Transverse post-tensioning then tied the slabs together. This technique substitutes plant fabrication, which could be mechanized, for much of the fieldwork, permits use of a thin slab, and eliminates troublesome joints and expensive abutments. Furthermore, it seems simple.

There are no doubt other schemes with comparable possibilities. The problems are not insurmountable. What is needed is more research to solve them. The probable benefits to be derived from low-cost prestressed pavements would seem to justify the effort and expense.

Cooperation on Missile Bases

TWO PIECES OF GOOD NEWS came out of the recent meeting Defense Secretary Thomas Gates had with leaders of labor unions involved in missile base construction.

First there was the officially released information on what was said at the meeting: Secretary Gates claimed that there were no current labor disputes delaying missile base construction and that he expects the program to be on schedule by the first of the year (ENR Oct. 13, p. 36).

Then there followed reporting of the not-officially-announced understanding reached at the meeting (Washington Observer, p. 23, same issue). The labor leaders reportedly told Mr. Gates that they would do all they could to prevent jurisdictional disputes from becoming work stoppages.

Secretary Gates had already met with construction contractors and missile component manufacturers in a productive conference that resulted in many suggestions for improving basebuilding procedures. Many of the suggestions are already being put into effect.

Now it would appear that construction labor has joined construction's contractors in supporting Secretary Gates in his strenuous new efforts to take the lag out of the missile base program.

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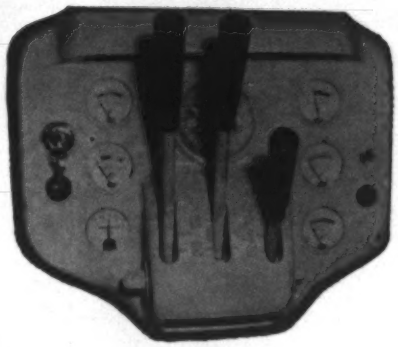

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